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DEATH'S REALM: WHY DID VIKINGS TAKE SLAVES & SHIPS TO THE GRAVE?

The background of the page is a dark, atmospheric photograph. It features two Viking helmets in the upper right quadrant, one with a prominent gold-colored nose guard. Several spears with wooden shafts and metal tips are visible, some pointing upwards and others angled across the frame. The overall color palette is dark, with deep blues, greys, and browns, creating a sense of mystery and historical depth.

Welcome

The last 50 years have seen a number of breakthroughs in the charting and understanding of the Viking Age. Archaeologists and historians have analysed everything from ancient postholes to thousand-year-old grape seeds in their quest to uncover the truth about the Viking world.

Painstaking detective work is necessary because the Vikings themselves did not record the events of their time. The history of the Vikings is known only from the horror stories of monks and the heroic tales of sagas. But armed with patience and modern technology, the unknown pieces of the puzzle are slowly being identified and put together.

Researchers have come a long way, but questions remain. For example, we still don't know who the first Vikings were, or why they set out on epic voyages. Nevertheless, we have a clearer picture of life in the Viking Age than ever before, and in this special issue we bring you the latest and best knowledge of the time when Norsemen with axes and swords wrought terror across Europe.

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Most accounts of
the Norse pagan
gods were written
200–300 years
after the Viking
Age ended.

From our article on Viking myths, a world academics are
still trying to fathom. Read more on page 78.

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“

The Vikings
probably navigated
using a simple
instrument – a
wooden disc with a
spike in the middle.

” One of the Vikings' most important navigational
instruments was probably the sun compass.
Read more on page 42.

”





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In the eighth century AD, the Norse started journeying beyond Scandinavia's cold climes. Historians are still searching for what drove this development.

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How could bands of marauding warriors with relatively primitive weapons defeat entire kingdoms? Answers can be found in both sagas and new discoveries.

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Researchers know little about the world of Viking gods. The few traces there are testify to a complex mythology, possible human sacrifice and Greek gods.

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Harald Bluetooth's ring fortresses were a gigantic engineering project that, once unearthed, has shed new light on the Vikings' mathematical prowess.

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Around 1100, the Viking Age officially ended as Scandinavia became Christianised. But in reality, the Vikings lived on for centuries.

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*Scandinavians began to
organise voyages to
unknown lands as early as
the year 700.*

THE FIRST VIKINGS

Sources describing Scandinavia in the eighth century are almost non-existent, yet historians are slowly beginning to chart life in the northern barren regions. The research has brought them closer to answering the big question: how did the Viking Age begin?

Few attributed much significance to the discoloured bones that appeared in the ground in 2008 near the small town of Salme on the island of Saaremaa, off the west coast of Estonia. The island had been the scene of fierce fighting between German and Soviet forces during World War II and discoveries of soldiers' remains were common. So, when a work crew digging trenches for electrical cables came across the bones, they called the authorities as required and waited impatiently for work to restart.

They were in for a long wait, for no sooner had archaeologists stuck their spades in the ground than long arrowheads and swords, rusty and brittle with age, emerged. The dig also revealed old game pieces, scraps of wool and pieces of wood. The bones belonged to warriors from a completely different era than first thought. The archaeologists had no doubt about that. But they could never have guessed that the discovery would provide crucial information about the origins of the Viking Age.

The find from Saaremaa became an important clue in understanding Scandinavia's transition to the Viking Age. It may seem strange that a single discovery on an island in the Baltic Sea could be so critical for archaeologists, but the reason lies

in the lack of written sources about Scandinavia's earliest history. Even now, 1,200 years after the first recorded Viking raid, the region's earliest years and its evolution to the Viking Age remain a mystery. The answers that historians seek are many. What did the settlements look like? Who were the first chieftains? When did Scandinavia become advanced enough to foster both fierce warriors and high-tech ships? Who first thought of sailing to neighbouring lands?

We know very little about any of this, but the Estonian discovery helped push the start of the Viking Age – and thus the development of Scandinavia – back half a century. We'll return to what that earlier date meant, but before historians

could draw any conclusions, the archaeological find in Estonia needed further investigation.

Discovery surprised archaeologists

During the following months of excavation, archaeologists uncovered the remains of a ship's hull. Most of the vessel's wood had rotted away, but the decomposition process had left discolouration that indicated the outline of the ship in the ground.

Together with hundreds of iron nails that the archaeologists also found, the researchers were able to reconstruct the ship's shape, size and appearance. Calculations told them that the

SAAREMAA

is located in the Baltic Sea and is Estonia's largest island. The sagas mention numerous battles between Vikings and islanders.

No sooner had archaeologists stuck their spades in the ground than long arrowheads and swords emerged.

boat had been 11.5 metres long and slender, with oars and room for 12 to 15 men. The shape and size of the vessel was similar to Scandinavian longships, and boats of this type had never before been found on those shores. A closer examination of the objects in the ship caused further puzzlement. In addition to skeletons and weapons, the finds also included a set of playing pieces. The pieces resembled those used by Vikings in the chess-like game of *hnefatafl*, and the weapons were of the kind used by the ancient Norse. The entire find seemed to be from the Viking Age, but carbon-14 analysis of wooden fragments concluded that the ship was built between 650 and 700 – almost 100 years before the attack on Lindisfarne Abbey that was supposed to herald the start of the Viking Age. Something didn't add up.

The discovery prompted researchers to look for evidence that the find was indeed a Viking burial site. If it was, historians would be able, for the first time, to get closer to the puzzle of when the Viking Age began and try to paint a picture of how the first Viking raids took place. A year and a half into the excavation, archaeologists discovered another ship. The new vessel, which the researchers named Salme 2, was 17 metres longer than the first boat, Salme 1, and had room for 30 to 40 men.

This ship was also distinctive in its narrow, flat-bottomed Scandinavian style. What's more, the archaeologists found several skeletons. The dead were piled on top of each other, as was the custom

at burials of Viking warriors. A closer examination left no doubt that many of the men had suffered a particularly violent death. Deep nicks in an upper arm bone tell of brutal sword fighting at close quarters. Injuries to one man's neck testify to an attempted decapitation, while another had the top-front of his skull hacked off, a wound that would have left his brain exposed. Some skeletons, however, bore no signs of struggle. The historians had no doubt that the dead men were warriors from eighth-century Scandinavia – Vikings. However, the discovery fundamentally changed everything archaeologists and academics thought they knew about the Norse warriors. First of all, the date was astonishing.

By analysing the bones at Saaremaa, researchers concluded that the warriors had set out with weapons in hand at least 40 years before Vikings attacked and sacked the monastery at Lindisfarne.

Scandinavia was a wasteland

Even more surprising was the Vikings' target. Saaremaa, unlike Lindisfarne, offered no riches. The island had neither towns nor markets. The discovery therefore led academics to wonder what drove the Vikings to the island. What was there that was so attractive to the Vikings in the eighth century that they set out in large numbers into the unknown? To find the answer, we must begin in the Vikings' homeland. The Norse's role as Europe's number one warrior people was far

“ The Norse's role as Europe's number one warrior people was far from a given at the start of the eighth century.

The first... Norse | 12,000 BC

Hunters headed north

People first settled in Scandinavia around 14,000 years ago. Archaeologists have excavated settlements from what is known as the Hamburg culture at Jels in southern Jutland and Sølbjerg on the Danish island of Lolland. They found arrowheads, scrapers and sticks, tools that could be used to smooth bones and deer antlers, among other things. From the discoveries, historians know that the early Norse were reindeer hunters. By examining the concentration of tools, the experts can identify areas in the settlement where the inhabitants processed the animals' skins and antlers. DNA studies have revealed that the first immigrants came from northern Germany and migrated from Denmark to Sweden and Norway.



The hunt for reindeer drew the first people to Scandinavia. Hunters from northern Germany followed their prey northwards.

Scandinavia on the eve of the Viking Age



In the eighth century, large marketplaces in Scandinavia began to develop into towns. These later became the foundation of Viking trade and provided wealth for the new Norse kings.

Kaupang: Norway's Kaupang was located on the Oslofjord, an ideal starting point for trade. Merchants came from near and far to trade in everything from furs and pottery to iron and whetstones. Kaupang was probably founded in the eighth century.

Birka: Birka on the island of Björkö in Lake Mälaren, Sweden, was one of the most important Nordic trading towns of the Viking Age. It was probably built by a king in the eighth century. The king's own estate, Hovgården, was located on a neighbouring island.



Ribe: The Danish town grew up around a marketplace in approximately AD 710. The marketplace was located on the Ribe River, which connected the town to the North Sea. The link to the sea made it easy to sail goods, animals and people to and from the town.



SCANDINAVIA

NORTH SEA

Hedeby: The Viking Age Danish town of Hedeby on the Schleswig Fjord (now in modern-day Germany) was founded in the eighth century. The town grew rapidly and soon had around 2,000 inhabitants, who built a rampart around the settlement to protect merchants and their goods.

Gudme: The settlement on the south-east coast of Funen, Denmark, was an important centre of power at the dawn of the Viking Age in the seventh century. Archaeological finds show that the local chieftain or king amassed great wealth, probably by taxing people and trade at the nearby trading post at Lundeberg. Gudme is an Iron Age settlement, but its structure was a model for royal Viking Age towns.



From the grave | Game pieces

DICE In addition to game pieces, archaeologists also found wooden dice in the Estonian grave.

VIKING GAME 250 playing pieces for the Vikings' chess-like game, *hnefatafl*, were found in the grave in Estonia.

HNEFATAFL The game is a variant of chess, which in its Scandinavian form has existed for millennia.

from a given at the start of the eighth century. Scandinavia was geographically isolated from the rest of the world, and the climate was often harsh and the winters unforgiving. As late as 1075 – at the end of the Viking Age – the chronicler Adam of Bremen described Jutland as “scarcely fit for human habitation”, “a desert, a salty marsh and a wilderness of solitude”.

The description is exaggerated, but settlements were scattered, and especially inland, far from the coast, Scandinavia’s communities and farms were quite some distance apart. Population density was low and life difficult. From around the year 400, the weather gradually became colder, and in 500 or thereabouts, a climatic catastrophe hit.

For three years, the sun barely shone, and cold and darkness descended on the Nordic countries. “[No] joy of the sun, then come three winters together and no summer between,” Snorri Sturluson

Scandinavia was described in Adam of Bremen’s chronicle. The German priest also wrote about Hamburg’s past in his History of the Archbishops of Hamburg-Bremen.

wrote in his poetry collection *Edda*, written in the early thirteenth century.

The change in climate was probably caused by a volcanic eruption, most likely in Mexico, which whirled ash and other particles up into the atmosphere. Scientists have documented the changes by counting tree rings and analysing samples from the Greenland ice sheet. In Scandinavia, where agriculture depended on sunny summers, people suffered badly when harvests failed.

The situation worsened when the cold climate caused plague-ridden rats to seek warmth in populated areas. With the rats, the Plague of Justinian spread from Central Asia to most of the known world, including Scandinavia.

Swedish archaeologists have found that the number of inhabited farms in some areas fell to one sixth of previous levels. The population declined and, in some places, people were forced to leave the land fallow.

Climate change boosted society

As the climate gradually warmed up again, the population grew explosively and concentrated in small towns and communities. This new form of settlement strengthened the chieftains, some of whom were now subject to even more powerful chiefs, acting as regional kings. The discovery of rich tombs shows that this happened from the start of the eighth century, just a few years before the Viking warriors set out for Estonia.

With the rise in temperature, Scandinavia became a better place to live and its geographical advantages could be exploited. The area was almost completely surrounded by water; the Atlantic and North Sea to the west, the Baltic Sea and Gulf of Bothnia to the east. The Norse were largely self-sufficient when it came to food and other necessities. Denmark, which at the time stretched as far as the River Eider in present-day Germany and included parts of southern Sweden, had plenty of fertile farmland.

Norway, despite vast mountainous areas covered in ice and snow, had lush fields where animals could graze and grain could grow.

Along the Scandinavian coast, the sea teemed with fish, and the waters were home to whales, seals and walrus. In forests and mountains, hunters could find bears, moose and other game, as well as foxes and wolverines with warm pelts.

In Sweden, there were fertile areas around the lakes of Mälaren, Vänern and Vättern. Throughout Scandinavia, large forests grew to provide timber for houses and ships. Both Norway and Sweden





Archaeologists Jüri Peets, Raili Allmäe and Liina Maldre examine artefacts found among the dead Vikings in Estonia.

also had abundant supplies of iron ore, so people could forge farm implements, tools and weapons.

Families lived in same settlement

The Norse shared a similar language, culture and dress, but Scandinavia was certainly not a single kingdom. The communities consisted of small clusters of houses and farms where several generations lived together. Some of the small communities were under the control of chieftains, local noblemen who, in return for war service and construction labour, protected the people against competing noblemen from outside. The balance of power, however – like the climate – was changing. The chieftains became increasingly powerful and gathered greater wealth and more warriors around them. The division of society into upper and lower

“ Weapons and other objects found at the excavation show that the Vikings stacked the bodies according to rank and status.

strata in the mid-eighth century is reflected in the Saaremaa find. The buried men were, as was the custom among the Vikings, piled on top of each other like firewood on a bonfire. Weapons and other objects found at the excavation show that the Vikings stacked the bodies according to rank and status. While the skeletons at the bottom of the pile were buried with simple, single-edged iron swords, the five men at the top were interred with distinguished double-edged blades and intricately decorated scabbards.

One of the topmost skeletons even had a finely carved game piece made of whalebone in its mouth. The piece depicts a figure from *hnefatafl*, a chess-like board game that Vikings carried on their boats to pass the time. Historians believe that the piece

SCANDINAVIAN STYLE From the Salme 2 ship, archaeologists have unearthed a piece of cloth woven in the Scandinavian style.



WOOL The piece of wool, which is more than 1,200 years old, was probably part of the sail.

may represent a king. The development of the hierarchy was, according to historians, closely linked to developments in Europe. Since the sixth century, chieftains had become increasingly prominent in local society, and by the eighth century, although there were relatively few of them, they were powerful and played an important role in Scandinavia.

The chieftains now owned large tracts of land, and their wealth and strength slowly transformed Scandinavia into a powerhouse. The new leaders could afford to pay warriors to defend or expand their power and territory.

Chieftains grew strong

To pay the warriors and boost their standard of living, chieftains increasingly began to trade for luxury goods from around the world. In addition to being used as currency, the goods – preferably gold and silver or fine everyday items – could be given away, bartered or just put on show.

The Nordic demand for imported goods went hand in hand with developments in Europe. Trade between the countries of northern Europe grew rapidly in that period, in terms of both quantity and variety. Throughout the eighth century, trading centres flourished on the coast of England, the rivers of western Europe and along the entire western coast of the continent. Towns such as Quentovic near Boulogne in what is now France, Dorestad in the Netherlands and Dorchester in England amassed great riches in gold, silver and exotic goods from distant trading centres.

And the Norse had begun to take part in this trade. When the Vikings started making voyages is unclear. We know that they reached Estonia around 750. And some historians speculate that the Norse sailed to the British Isles even before the Viking Age. Norse longships could easily

cross the narrow waters between the west coast of Norway and the Shetland Islands. When the wind was right, the journey took only about a day, and from Shetland the journey to Orkney was easy. On the islands, the Norse traded with the locals, then sailed back home.

Raids were well documented

Some of the Scandinavians' voyages in the 790s are well documented. They sailed to the British Isles, where monks and other clergy carefully recorded events. The Vikings probably used the route they knew from trade, sailing to the Shetland and Orkney Islands. From there, the sea route to the northern tip of Scotland was short, and the Vikings could reach it without major dangers or challenges. Indeed, the coastline along the west of Britain was similar to that of Norway, with bays and islets where ships could shelter at night and in bad weather.

The Vikings who attacked the monastery at Lindisfarne in 793 probably followed that route, too. Because the attack was well documented by English monks, the event has long officially heralded the Viking Age, but today there is no doubt that the raids and expeditions began much earlier. Once the Vikings had got a taste of the gold and wealth in England, the looting really took off.

We know from accounts that by 795 Vikings had travelled all the way around Scotland to the island of Iona, where the monastery of St Columba, renowned for its many learned monks and distinguished writing room, was established. Pious men such as the monk Alcuin of York, who, after the Lindisfarne raid, wrote of the Viking attack on "a place more venerable than all in Britain", warned that the events were God's punishment.

The Vikings themselves were probably primarily interested in easy prey, and ecclesiastical objects were often the least of the spoils. The

Continued on page 20

**MYTH-BUSTER****Lindisfarne**

Viking Age began at Lindisfarne

There are few sources about the early history of the Vikings, but the Norse raid on Lindisfarne Abbey in 793 is well documented. Detailed records led historians to believe that the Viking Age began suddenly.

Monks in European monasteries possessed the power of the written word. As clerics, they were accustomed to expressing themselves in writing, and the devout men did not mince their words when they described how, in 793, Norse warriors attacked and sacked the monastery at Lindisfarne. "Dire forewarnings came over the land of the Northumbrians, and miserably terrified the people: these were extraordinary whirlwinds and lightning and fiery dragons were seen flying in the air. A great famine followed soon upon these omens; and soon after that in the same year, on 8th January, the havoc of the heathen men miserably destroyed God's church Lindisfarne through rapine and slaughter," wrote the Northumbrian monk Alcuin, who was at the time a leading scholar and teacher at King Charlemagne's court in Aachen, Germany.

The monk's records are the first historical account of a Viking attack. The detailed description of the Norse raid and plunder led historians to believe that the attack was the first such Norse assault and that the Viking Age came into being almost overnight. Scholars now know that this view is incorrect.

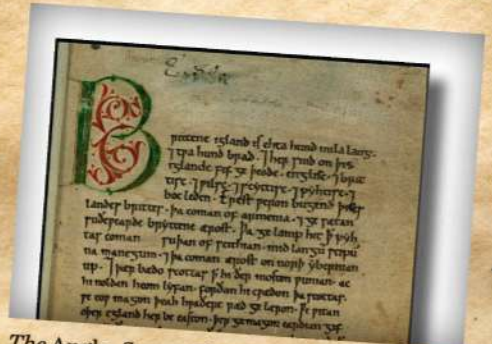
Instead, the Viking Age must be seen in the context of developments in the latter part of the Iron Age, from about 550 to 700. During this period, trade and other relations with the outside world increased. For example, the Vikings visited trading posts in the Baltic, places that were to

be of great importance to the Vikings' later trading networks in the east. Seventh-century Scandinavian-style helmets, shields and drinking horns found at Sutton Hoo in England also testify to connections across the North Sea.

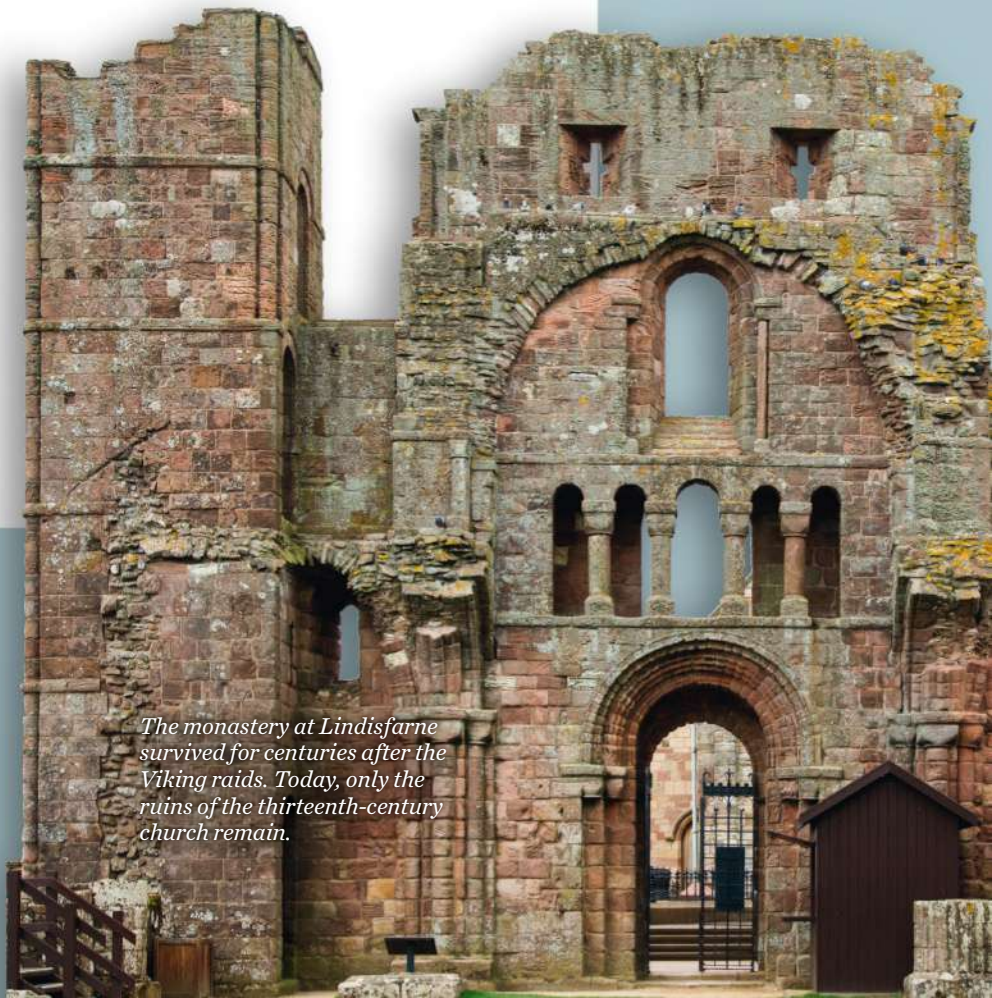
In Scandinavia, discoveries of royal estates and graves containing weapons testify to **a growing and well-organised warrior class, a prerequisite for the well-planned raids of the Viking Age.** When the Norse arrived at Lindisfarne in 793, the Viking Age had been underway for decades. The British were far from the first to be plundered by savage Scandinavians, they were just the most vocal.

THE MYTH IN BRIEF

The Viking Age began on 8 June 793, when armed Norse in sleek longships arrived at the island of Lindisfarne in north-east England. The invaders attacked the monks and stole the church silver. The event marked the transformation of the peaceful Norse into bloodthirsty Vikings, according to myth.



The Anglo-Saxon Chronicle describes the Vikings' attack on Lindisfarne.



The monastery at Lindisfarne survived for centuries after the Viking raids. Today, only the ruins of the thirteenth-century church remain.

“The British were far from the first to be plundered by savage Scandinavians, they were just the most vocal.

From **10,000 BC** to **AD 750**

SCANDINAVIA FROM THE ICE AGE TO THE VIKING AGE

More than 10,000 years passed between the first few Stone Age hunters settling in the barren regions of Scandinavia and the dawn of the Vikings' heyday.

Circa 10,000 BC

The first people migrate to Scandinavia shortly after the end of the Ice Age. The region's new population lives as hunter-gatherers.

Circa 4000 BC

Scandinavians begin to farm the land and keep pigs, sheep and oxen. The farmer uses an ard – a primitive plough. People live in longhouses and use flint tools.

536

Particles from a volcanic eruption block out the sun's rays and temperatures drop. Many Norse die of hunger and cold.

Circa AD 150

Scandinavians begin to express themselves in writing using runes. A comb found in Vimose, Denmark, bears the oldest inscription to date. On the comb, which is made of bone, is the man's name Harja. The name is thus the oldest known from Norse antiquity.

541

An epidemic, later named the Plague of Justinian after the Roman emperor of the time, spreads. In some places, farming ceases altogether and the population falls dramatically.

Circa 550

On the Swedish coast at present-day Uppsala, settlements flourish, probably as a result of industrious farming and extensive trade.

Circa 700

Merchants build a landing place on the Ribe River. It becomes Denmark's first trading post.

Circa 750

Merchants found the three important trading towns of Birka in Sweden, Hedeby in Denmark and Kaupang in Norway.



Circa 1700 BC

Scandinavians use weapons and jewellery made of imported bronze and gold, probably paid for with wool, skins and other Nordic natural resources.



Circa 800 BC

The Norse begin to exploit Scandinavia's deposits of iron ore. Iron proves to be much stronger than bronze and therefore more suitable for forging weapons and tools.



Circa 200 BC

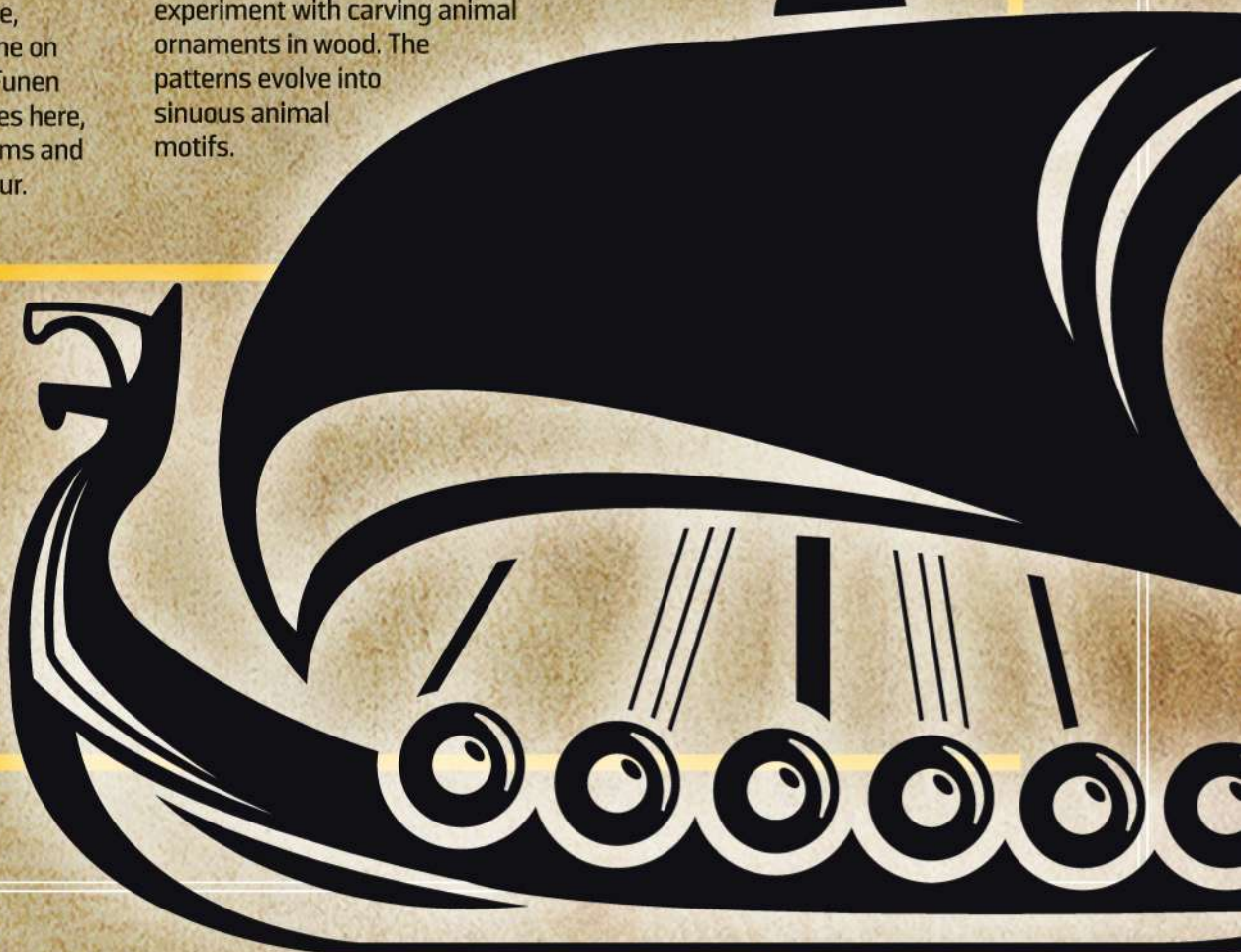
Power centres emerge, and the town of Gudme on the Danish island of Funen stands out. A ruler lives here, surrounded by 50 farms and close to a large harbour.

From 500 BC Finds of images of deities show that the Norse have developed their own world of gods, with Odin as the central figure. Craftsmen experiment with carving animal ornaments in wood. The patterns evolve into sinuous animal motifs.



Circa 750

Forty-one men die in battle on the island of Saaremaa in Estonia. Their grave bears witness to the Norse's first known expedition to foreign lands.



monasteries' holdings of gold and silver tended to be limited to small decorations on books and shrines. But the monasteries attracted many other riches. Indeed, in areas where there were no towns, religious buildings served as centres of power, where wealth was concentrated. Here the Vikings could get their hands on coins, jewellery or ornate everyday items, and the area was repeatedly ravaged by small, roving bands of Norse.

Lack of space

According to accounts, the Norse used the same tactics on the European continent, where Viking fleets sacked monasteries and their environs at the mouth of the Loire River from 799. The riches around Europe's churches and monasteries must have drawn the

Norse like a magnet. However, scholars doubt the search for gold and church silver was all that drove the Vikings' armed expeditions. Explanations for Norse expansion, which took off in earnest during the ninth century, have been many and varied. Historians of the past believed that the Vikings

set out due to necessity, because Scandinavia did not offer natural riches itself.

"Norway is the most unproductive of all countries ... Consequently, there are produced very valiant fighters ... not softened by any overindulgence in fruits ... the Danes ... are just as poor ... Poverty has forced them thus to go all over the world and from piratical

raids they bring home in great abundance the riches of the lands. In this way they bear up under the unfruitfulness of their own country," Adam

“ Norway is the most unproductive of all countries ... there are produced very valiant fighters ... not softened by any overindulgence in fruits.

To the people of England, the mighty, well-armed warriors from the north must have seemed terrifying. The fight against the invaders was a lost cause.

of Bremen speculated. Riches, however, didn't just mean silver and gold. More recent theories suggest that slaves were the Scandinavians' most sought-after treasure in foreign lands. According to archaeologists and historians, Iron Age Scandinavians probably kept slaves to do the hard work in the fields, for example.

As trade and international relations grew, so did the need for labour. Indeed, commerce caused the Norse trading fleet to grow rapidly in the eighth century. And so the demand for the heavy woollen sails that powered the ships also grew. The production of sails up to 90 square metres in size required a massive amount of labour. Farmers had to set aside vast areas of pasture for sheep to supply the wool the sailmaker required.

The sailmaker cleaned and wove the wool before finally cutting the sails and sewing the fabric together – a process that could take up to five years in total. Since each ship needed two sails, and

the Norse had hundreds of ships between them at the time, the need for labour must have been enormous. From historical sources, academics know that the Norse captured, transported and sold slaves throughout the Viking Age. The **sagas** – early accounts of Norse life, beliefs and world – frequently mention *thralls*, or slaves.

Excavations outside the Swedish cities of Stockholm and Sanda also suggest that owning slaves was both more widespread and more ingrained in Viking society than previously thought. Near Stockholm, archaeologists have found traces of a large, round hut built on a slope above a large house. A dig at Sanda also revealed the remains of a cluster of smaller houses around a main building. "It's not going too far to see these as the big house on a plantation," says archaeologist Neil Price from Uppsala University. In fact, Canadian archaeologist Ben Raffield believes that up to 25 percent of the population in

THE SAGAS

are tales about the Viking Age, and most of them, including the best preserved, come from Iceland. The sagas were written about 200 years after the Viking Age.



Evidence | Beads



Viking Age Scandinavian may have been slaves. It's possible that the thralls weren't only used for labour. Academics know that men from the Germanic culture south of Scandinavia often had several wives. If the same were true among the Norse of the seventh and eighth centuries, researchers assume that a lot of men brought back women from outside the Nordic countries.

Genetic studies of Iceland's present population show that female immigrants were a major constituent of early Viking society. Research shows that three quarters of the current male population originated in what is now Norway, while more than half the women are descended from people from the British Isles, a distribution that suggests a marked preponderance of female immigrants. Since the country has not seen significant immigration since the Norse settled a thousand years ago, the introduction of foreign women must have occurred during the Viking Age. Scholars hope that genetic studies – from burial sites in Estonia, for example – will help to reveal the extent to which the Vikings brought slaves into the area, and thus the role that the importation of

slaves played in the development of the Viking warrior culture.

Rivalry in Estonia

Researchers believe that the Vikings in Saaremaa came from Sweden. The island is just three to four days' sail from central Sweden and only one or two days from Gotland island. However, historians do not know why and against whom the Vikings of Saaremaa fought. One theory is that one Viking fleet ran into another and the two forces clashed.

Based on previous findings and written sources, researchers concluded that the skeletons found were part of a much larger force. It is possible that as many as 600 Vikings on 20 ships arrived on the beach at Saaremaa. Arrowhead marks on the sides of the ships suggest that the battle began while the Viking ships were still on the water.

At some point, the Vikings probably pulled the ships ashore to use as a protective wall around the warriors. The technique was described by the chronicler Saxo. "Partly with their own and their adversaries' vessels which they had commandeered, and to some extent with piles of logs and tree trunks from the forest, they built a fortification the size of a castle," he said of a battle between Vikings and Estonians on Öland in 1170.

Historians don't know who won, but the Vikings buried their dead in the larger ship, Salme 2. The vessel probably carried the most senior warriors to the battlefield so was considered more noble.

The warriors took food with them to the grave. Piled on the shields, which were placed on top of the dead, were the bones of animals such as sheep and cows, supplies for the final journey. Finally, the warriors covered their dead and the ships with sand. The work was hard, for the Vikings had only their hands and helmets to move stones and shovel sand, but a proper burial was a matter of honour.

Over the next 1,300 years, the sea retreated until the boats were 182 metres from the water. There

they lay in the sand, until 2008, when a work team came across a bone, enabling historians to take a step closer to solving the riddle of the first Vikings.

The discovery is evidence that Scandinavia was ready for greatness in 750. Powerful chieftains could gather mighty armies. Blacksmiths could forge swords and axes, and shipbuilders and sailmakers could build fleets. The climate was kind to the northerners, and the population healthy and strong. The Viking Age could begin. ■

Genetic studies of Iceland's present population show that female immigrants were a major constituent of early Viking society.



WE KNOW FOR SURE

The Vikings were well equipped for success

- The warrior society was **strictly hierarchical**.
- Ship crews were **well organised** for raids.
- The Vikings had developed **stable and seaworthy ships**.
- They had weapons **suitable for close combat**.
- Nordic warriors were **tall and strong**.
- The Vikings had **well-developed fighting techniques**.

750

is so far the earliest possible year for the start of the Viking Age. It is the year when warriors from Scandinavia were slaughtered in Estonia. Probably a long series of raids preceded the event.



WE NEED ANSWERS

How powerful were the first rulers and chieftains?

1

No contemporary written sources mention Scandinavia in the eighth century, so historians' knowledge is limited. But in order to organise voyages to

new lands, **Viking society must have been well developed**, with a surplus population and good knowledge of diplomacy and geography outside Scandinavia.

Why did the Vikings travel?

2

No sources from the period provide answers as to why Scandinavians suddenly chose to travel abroad. Historians believe that the pursuit of land, slaves, wealth and **personal honour, as well as a sense of adventure**, were important factors. Ship technology also developed a lot in the latter part of the Iron Age. According to historians, ships probably began to have sails at this time, a change that enabled the Norse to travel longer distances in less time. No one yet knows whether any of these factors were decisive and, if so, which ones, and why Viking societies were ready for long-distance voyages in the eighth century.

The question of who first came up with the idea of seeking wealth outside Scandinavia will probably never be answered.





During the winter months, life moved indoors. Around the longhouse fireplace, the men carved while the women made clothes and other necessities.

HOW DID THE VIKINGS LIVE?

Everyday life for a Viking was largely unknown for a long time, because written sources are few and artefacts scant.

Nevertheless, historians have recently pieced together a picture of Viking settlement life, which may have included winemaking and the struggle to harvest enough rye.

Every year, when spring was in full swing, the Vikings got busy. As the sun shone and the lark and the lapwing sang over the fields, the men hauled sacks and barrels of provisions on to their ships. Dried meat, salted herring and plenty of grain for porridge were stowed under the planks that covered the decks of the longships. Then the men carefully packed their weapons and went on board. In the early morning, they set sail for foreign shores to trade, plunder or conquer new land. Behind them, the Vikings left the village women, children and elderly, as well as farm animals and freshly sown fields. When the men returned in the autumn, the animals would be fat after months of grazing and the crops would be plentiful in the fields.

So goes the myth. But the Vikings were not just warriors and traders. The vast majority of the Norse in the Viking Age were farmers, who worked all year round to provide food for their families and to feed warriors, traders and craftsmen. The men on the farms always had to be ready to go on a journey and leave the farming to the women who, with the help of the elderly, children and servants, were responsible for the farm while the men were

away. The peasantry formed the backbone of society. Without the farmer and his family, society would have ground to a halt and war and raids would have ceased.

How the Scandinavians managed to sustain life in the cold and often barren regions of the north, and even provide enough food for the Norse warriors to make the Viking Empire one of the most powerful of its time, has long been largely unknown. While swords, warriors' skeletons and the testimonies of monks bear witness to Viking battle culture, traces of life in Scandinavia during the Viking Age are sadly scarce. But when historians came across a series of dark and light stripes in the soil layers of the Jutlandic moors in 1999, they found a crucial piece of the puzzle of the Vikings' past.

When historians came across a series of dark and light stripes in the soil of the Jutlandic moors, they found a crucial piece of the puzzle.

New plough made soil fertile

Today, we know that the stripes in the Jutlandic topsoil and the different shades of the layers are evidence that the soil was turned with a mouldboard plough, an advanced tool by the standards of the time, which historians previously thought only gained a foothold in Scandinavia in the early Middle Ages. This new implement, unlike its primitive predecessor, the ard – or scratch plough – not only cut a furrow for the seed, but

RYE

Rye was originally a weed in wheat fields, but as the plant had a much better yield, farmers switched to growing it on a large scale.

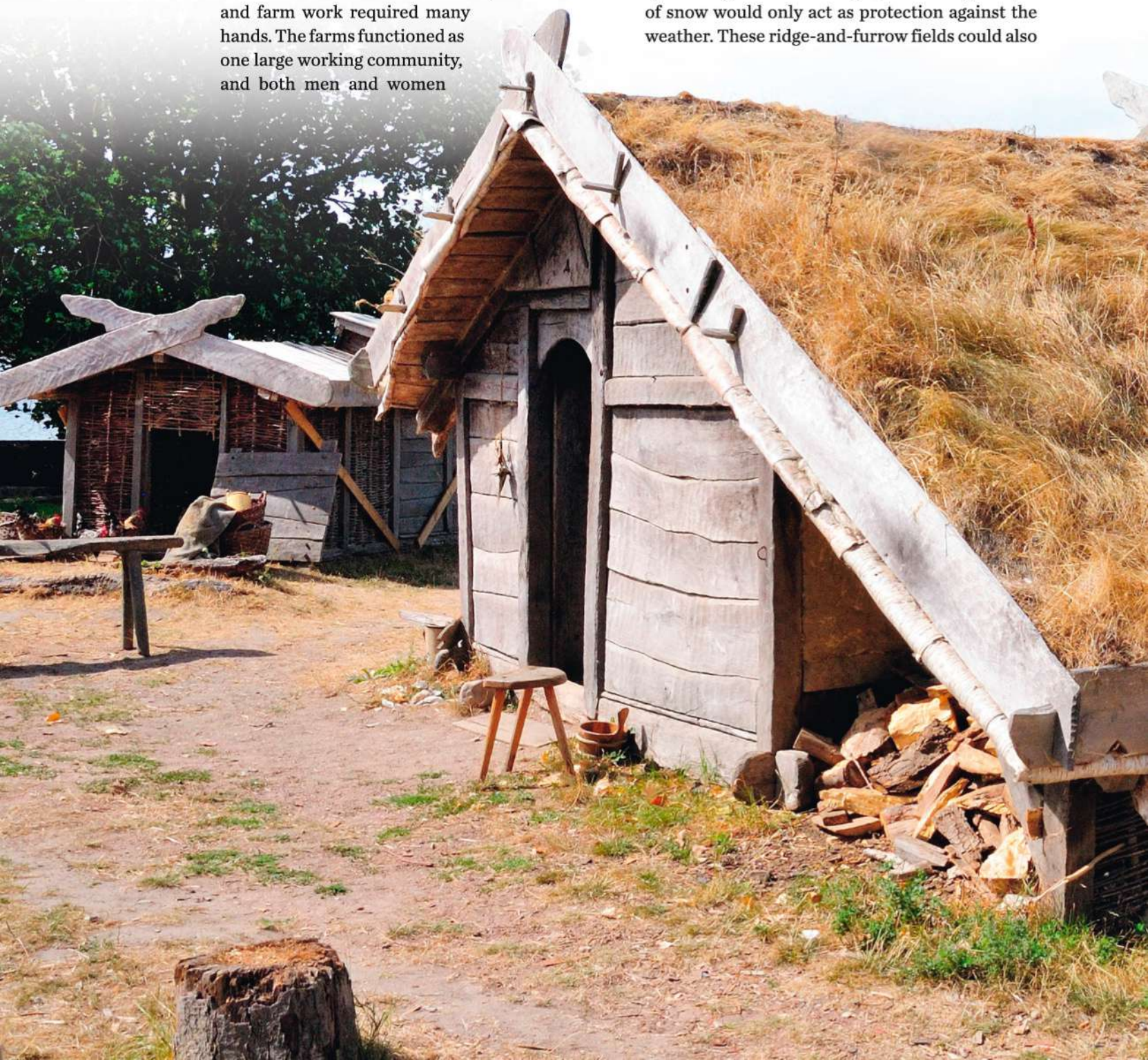
also turned the soil, which meant bits of vegetation entered the soil and provided nourishment for the new crops. The many discoveries of well-preserved plough tracks and iron and wood remains from the ploughs themselves reveal that the new type of implement was already in use in the latter part of the Iron Age, and that the Vikings used the plough extensively in their struggle to put food on the table.

The mouldboard plough enabled farmers to get more out of the land. Efficiency was important not only for the Norse who had to exploit the limited stretches of fertile land between mountains and glaciers, as in Norway, but for all Viking families. Both time and labour were limited, and farm work required many hands. The farms functioned as one large working community, and both men and women

participated diligently in the work – even the children toiled in the fields.

Using iron sickles, the farmers harvested the grain in the field each autumn – mainly **hardy rye** they had imported from the south. On more fertile land, the Vikings could also grow barley, as well as oats and the much sought-after wheat. The mouldboard plough also allowed the Vikings to grow winter rye, a particularly hardy cereal.

The new plough enabled the farmer to create ridges in the fields by ploughing the landscape in such a way that the soil lay in waves, forming peaks and troughs. The ridges diverted water away from the crops, so they were not covered in ice. Winter rye could grow on the ridges, where a light layer of snow would only act as protection against the weather. These ridge-and-furrow fields could also



be used for other crops and had the advantage that in dry years yields were good in the troughs, while during wet years the plants thrived best on top of the peaks. The ridge-and-furrow fields fell into disuse in the nineteenth century, but the old meadows with their characteristic shape are easy to spot in today's landscape, for example at Hammel in central Jutland.

Dairy products provided energy

The harvested grain was used by the Vikings to bake bread and cook porridge – foods that formed the central part of the Norse's two main meals: breakfast, served a few hours after the start of the working day, and dinner, eaten at the end of the day. During breaks, the farmers ate bread, cottage cheese and perhaps raspberries, wild apples or hazelnuts that they found in the woods. They quenched their thirst with water, weak beer or milk from cows, goats and sheep.

Evidence from refuse tips tells archaeologists that in addition to porridge, bread, fruit and vegetables, the Vikings also ate fish and meat. On the land around the farm there were pigs, goats, geese, horses and oxen, as well as the

Hygiene | Ear cleaner



THE SCRAPER for cleaning ears was widely used and an important part of hygiene rituals. The tool was usually made of bone or wood.

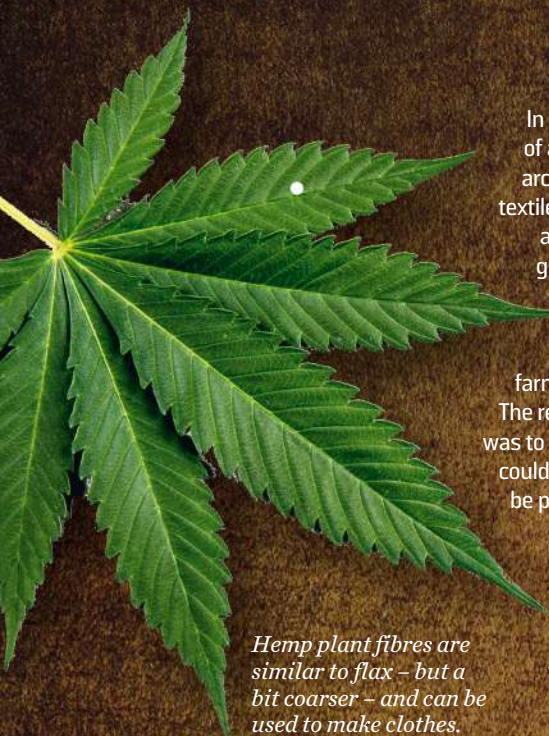
Vikings' most important livestock, cows. Some of the animals were slaughtered at the beginning of winter, and the meat salted or smoked. However, the need for dairy products, which provided a reliable source of nutrition throughout the cold months, meant that the farmer preferred to avoid slaughtering his animals. Only those cows that the farmer did not have enough hay to feed during winter were culled.

Archaeologists have found traces of cows up to ten years old – proof that the animals were not kept primarily for their meat, but mostly ►

Examples of Viking houses at the Foteviken Museum in Skåne, Sweden. Animals could graze on the low roofs of the houses, and small huts were easier to heat than large longhouses.

Analysis of small fibres tells us about clothing

Only under very special conditions are larger pieces of cloth preserved. Archaeologists must therefore analyse tiny fibres deposited on the back of jewellery, for example, to determine how the Vikings dressed. It is likely that they wore wool, animal skin and hemp.



Hemp plant fibres are similar to flax – but a bit coarser – and can be used to make clothes.

Hemp

In 2012, a sample from the excavation of a farm in Kyrkjebygda, Norway, gave archaeologists new insights into Viking textile production. The sample came from a bog and shows that the inhabitants grew hemp in the years between 650 and 800. Since hemp pollen can't travel far on the wind, the researchers assume that the farmer deliberately planted it in the bog. The researchers suspect that the purpose was to moisten the fibres so the outer ones could be easily removed. Hemp fibres can be processed and used to weave textiles for clothing. Unlike wool, plant fibres such as flax and hemp decompose and perish after a short time in nature. Academics therefore do not know to what extent the Vikings used hemp to make clothes.

Animal skin

As an outer layer, the Norse wore wind- and waterproof garments. Archaeologists in the Faroe Islands have found clothes made of skins treated with beeswax and fish oil. The beeswax makes the clothes waterproof, while the fish oil softens the stiff skin. The find predates the Viking Age, but scholars believe the Vikings treated their clothes in the same way, possibly with a kind of tar extracted from the sap of birch trees.



Modern tests show that skins treated with birch tar are both hard-wearing and water-repellent.

Wool

The chilly and changeable Scandinavian weather made it necessary for northerners to dress both warmly and flexibly. The Vikings therefore wore several layers of clothing that could be taken off and put on as needed. As a bottom layer, the Vikings wore wool, which keeps the body warm even in severe cold, and which also has the advantage of drying quickly again once it has become wet from sweat or moisture in the air.

Wool was the most common material for Viking clothing. Clothes were woven, knitted and sewn during the winter months.



for their ability to produce milk that could be processed into nutritious cheese and butter. It may even be that the Vikings used milk in ways that historians have yet to fully understand. *Egil's Saga* and *Grettir's Saga* mention *skyr*, a protein-rich curdled milk product, which the Vikings ate in Iceland. *Skyr* probably came with the Vikings from Norway, but it is unclear how widespread the food was in the rest of Scandinavia. Whether the taste and texture were similar to the modern-day product is also unknown.

Fish was an important source of nutrition in those parts of Norway and Sweden where the terrain and cold made it difficult or impossible to grow cereals and other crops. However, the Norse ate fish for reasons other than pure necessity. The Arab traveller al-Tartushi reported that the inhabitants of the Viking trading town of Hedeby in Denmark were fond of eating fish.

The population could choose from 26 different kinds of fish, with salted herring being the absolute favourite, al-Tartushi said. Discoveries of nets, hooks, eel spears – a large, three- or four-pronged fork used to impale eels – and fish bones confirm that fishing was an important occupation in and around Hedeby.

Rich and poor feasted

In the village, the Vikings lived in houses built with wooden posts and wattle and daub walls. By measuring the distance between the post holes, archaeologists have found that the houses could be up to 40 metres long and seven metres wide. Findings show that the farmer lived with his wife and children in a large family group, which included several generations, and up to 50 people. Brothers, sisters, cousins and even more distant

relatives lived under the same roof, so in practice each village often formed a family clan.

In summer, the clan feasted. Beer and mead flowed freely, and bards helped the celebrations by playing lyres – harp-like instruments with six strings. The village echoed with men and women shouting and singing along to the old folk songs that had been passed down through the generations. Historians know of the bards and some of their songs and poems from the sagas. Archaeologists have never found a complete lyre, so the sound it made was a mystery for a long time. However, the small fragments that have survived have been studied and researchers have been able to form a clear picture of the instrument and its sound.

But al-Tartushi, who heard the inhabitants of Hedeby singing, was far from impressed. The performance, the traveller reported, seemed more like “a growl ... like the barking of dogs, only much more beastly”.

Among the upper echelons of society, the celebrations were conducted with more style and decorum. Manors – the sumptuously furnished ➤

The responsibility for making clothes lay with the Viking women, who spun wool by hand.



Viking intoxicants



BEER

Viking beer was brewed from barley in two versions: one with a

high alcohol content and one with a low alcohol content. The weak beer could be enjoyed by everyone – even children – and was a nutritious alternative to drinking water, which was often polluted and carried a high risk of illness. On festive occasions, stronger beer was enjoyed by Vikings from all walks of life.



MEAD

Nordic mead was a sweet, fermented drink made from honey, water and spices.

Mead had an alcohol content of around 20 percent and was enjoyed at feasts and religious rituals, as it was considered the drink of the gods. By consuming the sweet liquid, the Vikings believed they were closer to the divine, and looked forward to the joys of Valhalla, where mead flowed freely.



WINE

Wine was a luxury that the Vikings imported from other countries, probably most often from France. It signified status, and only the richest could afford to get drunk on the precious beverage. Archaeological evidence suggests that the Danes themselves brewed wine in small quantities. Like imported wine, the homemade product was reserved for the upper echelons of society.



Viking life is being mapped out by studying finds in rubbish pits and analysing bones and teeth from skeletons, including this woman who lived in the Viking town of York at the end of the Viking Age.

In soil samples from the Tissø settlement, researchers have found two grape seeds that are causing a stir.

homes of the leading families – were the most significant hospitality venues of the age and hosted important people from near and far. Merchants, craftsmen and peasants flocked there to barter goods and worship the gods, who would ensure peace, fertility and plentiful harvests. As for the menu, the food was as good quality as that of the higher classes in later ages. The feasts are particularly well described, unlike everyday life, which has to be pieced together from archaeological finds and analysis. The poem ‘Rígsþula’ (‘The Lay of Rig’) – which dates back to the Viking Age – tells of a feast at a rich man’s house: “brown-fried bacon and roasted birds. There was wine in a vessel and rich-wrought goblets”. The poem also describes the fine linen tablecloths and silverware. On a farm near Lake Tissø in eastern Denmark, the owner even managed to impress guests with a tour of his two-storey hall.

Cultivated grapes?

Perhaps the great hall and an undoubtedly sumptuous dinner were not the only things to impress the chieftain’s guests at Tissø. There are many indications that he had something very special to offer. In soil samples from the Tissø settlement, researchers have found two grape seeds that are causing a stir. One of the seeds comes from soil that belonged to an early settlement, Bulbrogård, on the site, and can be dated to the

late Iron Age. The second seed, found about 600 metres from Bulbrogård on the site of the Viking Age manor house, is about 200 years younger and dates from the Viking Age.

The difference in age between the two finds suggests that the seeds did not arrive at the settlement by chance – in a wine barrel, for example – but that they originated from locally grown vines.

Examination of one seed using strontium isotope analysis – a method that can map the habitats of plants, animals and humans – confirms that the seed came from Denmark and probably from Zealand, where Tissø is located. The second seed was analysed by carbon-14 dating but proved too small for the researchers to extract a strontium isotope sample.

“This means that for the first time we can say that they may have produced wine in Denmark. Before we had only conjecture, now we can see that they actually had grapes, and thus potential to make it themselves,” said Danish professor Karin Margarita Frei after the discovery in 2015.

The grape seeds illustrate what scholars are up against and what they manage to do when mapping life in the Viking Age. Finding two small grape seeds that are more than 1,000 years old and then subjecting them to high-tech analysis to deduce that the Vikings grew grapes shows the enormous amount of work that goes into each discovery.

Historians can’t say for sure whether the Vikings used the grapes to make wine. Archaeologists have found objects decorated with bunches of grapes, however, so the Vikings must have known about the fruit. The Norse may also have dried grapes to make raisins, giving them a food that keeps well, is high in energy and is being easy to carry on long journeys by land or sea.

For those who believe that wine was made in Scandinavia, Frankish sources seem to offer good support. These tell us that the Vikings drank wine during their raids on Europe’s rivers.

Several texts also report that the Vikings liked the drink and that the Norse even agreed to keep the peace in the Frankish Empire in return for gifts of copious amounts of wine.

Could the Vikings have acquired not only a taste for wine, but also the knowledge to produce the intoxicating drink from the Frankish Empire? Or did they learn the noble art of winemaking in England, where researchers have also found traces of wine production?

Historians don’t know, but they have no doubt that wine production in the Viking Age was both possible and probable. Today, winemaking



Continued on page 34



MYTH-BUSTER

Viking horns

Did Vikings wear horns on their helmets?

The most recognisable image of a Viking is a man with horns on his helmet. The horns would have made it almost impossible to fight effectively, so Vikings wearing horns are in all likelihood a myth.

Viking warriors wore helmets for protection, but the headgear was not fitted with horns. The misconception arose in the nineteenth century but has its roots in the Renaissance. At that time, European scholars – inspired by the historians of antiquity – began to depict the Germanic tribes that had fought the Romans as wearing helmets with horns. During that period, academics perceived the Germanic people as both noble savages and dangerous barbarians. By turning them into noble warriors and providing them with horns on their helmets, the scholars were able to reconcile the two views.

The idea of horned helmets was transferred to the Vikings by artists such as the Swede August Malmström, when the Viking Age became fashionable in Scandinavia in the nineteenth century. Malmström and other artists probably **drew further inspiration from the discovery of horned helmets** in Bronze Age graves around Europe. The helmets were not warriors' gear, however, but decorations intended to send religious or political signals.

The misconception spread across Europe when designer Carl Emil Doepler created costumes for Wagner's *Ring Cycle*. Doepler fitted the show's Vikings with horns on their helmets. The opera was a great success in Germany and then went on to tour Europe. As did the idea of the horned Vikings, which quickly spread through the art and literature of the time. Vikings with horns

on their helmets were even depicted in school textbooks in England.

No historical sources mention horns on Viking warrior helmets. Some depictions from the Viking Age – for example, in the Oseberg ship from Norway – show helmets with horns. But researchers point out that the figures from the Oseberg ship do not depict ordinary warriors, but berserkers, wild warriors who threw themselves into battle in a frenzy. Archaeologists have also found small figures of people with horns on their helmets. The figures were probably used for religious rituals or other cult purposes. Historians also believe that the Vikings may have worn horned helmets for religious purposes, and they were worn by people they considered to be particularly close to the gods. **In any case, researchers agree, the horns were not used in battle.** In combat, the horns would only have got in the way.

THE MYTH IN BRIEF

A real Viking wears a helmet with two horns on his head – every child knows that. The helmet emphasises the Viking's rugged appearance and makes him easily recognisable in drawings and paintings.



In Vekse, Denmark, archaeologists have dug up horned helmets from the Bronze Age.

In nineteenth-century paintings, Vikings were suddenly wearing horns.



“ Depictions from the Viking Age – for example, in the Oseberg ship – show helmets with horns.

From **January** to **December**

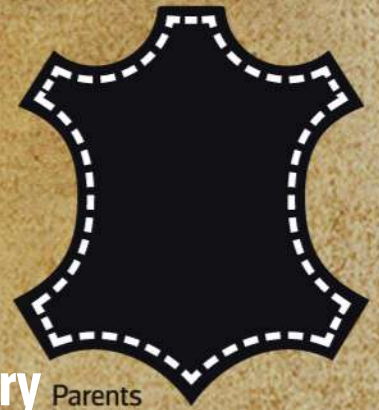
VIKINGS WERE BUSY ALL YEAR ROUND

The Viking household was self-sufficient and sustaining life required hard work throughout the year. Everyone had to help if the family was to have food and clothing, and make it through the long winter.

January In the dark, the Vikings gather around the hearth. Here the elders share stories. Family history, practical knowledge and tales of gods and heroes are passed down.



February Parents teach children various crafts. Mothers teach girls to sew, while fathers show boys how to forge or carve wood.



August The Vikings harvest their crops, bind them into sheaves and dry them in the field next to a fire. After, the farmers put the crops on the barn floor and thresh them so that the grain is separated.

July The farm workers shear the sheep or gather the wool. Among the Viking sheep breeds is the Old Norwegian, a breed that sheds its wool when the weather gets warm.



September The farm workers harvest grass and gather it into piles. The grass dries into hay, which the animals can eat over the winter. The Vikings also gather apples, berries and nuts for winter supplies. Some settlements have their own orchards. In other places, the Vikings go foraging in the countryside.



October The Vikings hold the Winter Nights harvest and sacrifice festival. Here they kill specially chosen animals – such as horses – in thanksgiving to the gods. Other farm animals are taken back to the stables.





March The farmer works the fields with a plough pulled by an ox. When the soil is turned, he sows the grain.

April Sheep and cows are released from the stables and put out to pasture. The fencing is close to the farm so that the animals are not far away when it is time to milk them. Wethers – castrated rams – which the Vikings keep for their wool, are sent to pasture in meadows a little distance from the farm.



June The farm workers collect chicken eggs and salt them. Salted eggs can keep until winter, when the hens don't lay as much.



May Vikings catch fish to add variety to their meals. One method the Vikings use is to put a net between two wooden poles in a stream. Soon trout, pike and perch are splashing in the net.



November Women spin and weave wool in the long winter evenings. The men weave ropes from bast, the inner bark of the lime tree.



December The men forge new farming tools and repair those that have broken during the autumn. Wood carving is also a popular winter occupation.

Hygiene | Comb

COMBS One of the most common discoveries from the Viking Age, combs were made of either wood or bone and often decoratively carved.



TEETH Some combs had particularly close-fitting teeth at one end, so they could be used to catch lice.

in Denmark is viable. From studies of tree rings and ice cores in Greenland, we know that the weather between 800 and 1200 was warmer than now, so farmers could easily have grown vines that produced enough grapes to make wine.

Tissø, moreover, would be just the place researchers would expect to find such unusual and extravagant production. The elite lived there. Wine, scholars believe, was used to demonstrate power and status, and impress visitors – useful in a society where rivals were always waiting to take over.

Tall and well fed

In the longhouse, the farmer had to make do with beer, which was the Vikings' drink of choice. The beer was brewed from barley and there were two types – one strong and one weak. The two different varieties meant that the drink could be consumed both in everyday life and at parties, and by children as well as adults. Beer was probably also on the

menu when the Vikings had their evening meal as the darkness descended both outside and inside.

The houses had only one entrance – located at one end of the building – and no windows, so the Norse had to chase the darkness away with candles made from animal fat. Finds reveal that the Vikings were fond of games, using boards and dice. In particular, the Norse played *nitavl*, a game similar to today's Nine Men's Morris, and *hnefatafl*, a chess-like game that the Vikings had learned from tribes in Germania.

However, the Vikings also knew that games were not just fun, but could be addictive, too. "There are certain things which you must beware of and shun like the devil himself: these are drinking, chess, harlots, quarrelling and throwing dice for stakes," admonishes a passage in one of the sagas.

Historians don't know whether the Vikings gained weight during their winter inactivity and the feasts that followed a slaughter, but skeletal remains show that the Norse were well fed. Studies of a total of 320 skeletons show that men measured 172.6 centimetres in height on average, while women were 158.1 centimetres tall. By comparison, the average height in 2018 was only about ten centimetres more, at 181.4 cm for Danish men and 167.2 cm for Danish women.

The Vikings were tall due to their nutritionally rich diet, especially its high protein content, which is essential for growth. Wealthy men and women were therefore taller than people from the lower classes. For example, archaeologists have measured two skeletons found in a double grave on the Danish island of Langeland.

Two adult men were buried there. One was buried with a spear, while the other was decapitated and bound at the feet. The first – which researchers assume was a chieftain – measured 177 cm, while the second, assumed to be the chieftain's servant, measured only 171 cm.

Historians believe the Vikings had more muscle mass than modern people, because of the labour they did. But the Norse of the time did not grow old. Skeletal remains show that Vikings rarely lived past 40. Women often lived a little longer than their male counterparts, a fact that also holds true today. Some of the skeletons found also show signs of osteoarthritis, and many skulls are missing teeth. On the whole, however, academics believe that the Vikings were both healthy and strong by the standards of the time.

Vikings loved games of strength

For Vikings, however, muscle mass was not enough. The farmers also had to keep agile and

Servants could be recognised by their undyed clothing, reserved for the lowest in society.

Continued on page 39



*Winter was spent in the longhouse,
which served as living room, bedroom,
kitchen, stable and workshop.*



How did the mouldboard plough help the Vikings to greatness?

The discovery of 1,000-year-old plough tracks in the Jutland moors shows that the Vikings had the mouldboard plough at their disposal. This new type of plough ensured a much higher yield than before, protected the harvest from the vagaries of the weather and made it possible to grow rye in winter. With the mouldboard plough, the Vikings could feed a rapidly growing population.

BEFORE: Ard

Ard left the land barren

The ard is the earliest form of plough known to historians. Plough tracks show that the Norse used the ard in the Stone Age, around 3000 BC. This simple plough was made of wood and consisted of only one ploughshare, which was pulled by oxen to cut through the soil. The farmer

then placed seeds in the furrow created by the plough. As the implement did not turn the ground, it did not help the soil to use natural nutrients from crop residues or add fertiliser, in the form of manure, for example. The result was that the soil became depleted and yields fell.

BENEFIT TO SOUTHERN EUROPE:

In southern Europe, where the soil is loose and sandy, farmers did well with the earliest functioning plough – the ard. However, the tool was not well suited to the heavy, clay soils of northern Europe. That's why the first plough, the ard, only brought growth and prosperity to the growing cities of southern Europe.

Ploughshare was clumsy and difficult to control

1 The ard loosened and crumbled the soil, creating a furrow where the grain could be sown. The simple plough was difficult to control, heavy to pull and produced poor furrows.



The plough was pulled by horses or oxen.

Yoke for draught animals

Ard was made of wood

2 From the few well-preserved finds, we know that the ard was made of wood and that the share was made of particularly hard wood or, from the tenth century, of iron.

Farmer sowed seeds in the furrow

3 Crop residues and manure were ploughed up and remained on top of the soil, thus not supplying nutrients to the grain. The soil was depleted and the harvest yield fell.



AFTER: Mouldboard plough

Mouldboard plough provided nutrients

We know from plough tracks that the Vikings used the new mouldboard plough. Unlike the ard, the mouldboard plough turned the soil as it cut a furrow through the field. When the soil was turned, crop residues penetrated the earth and supplied it with nutrients. Because the plough was heavy to turn, the farmer made long furrows. In this way, he kept turning the soil up towards the same point in the field,

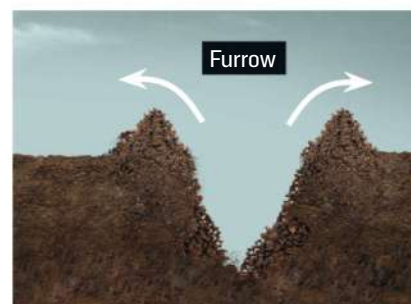
which then formed a wave-shaped landscape. In wet weather, the rain collected in the valleys of the waves, which acted as a drain, preventing the crops from being destroyed by rain and ice. These ridge-and-furrow fields improved yields, because the higher-lying parts grew crops better in wet weather, while the lower-lying parts ensured good harvests in dry periods.

BENEFIT TO NORTHERN EUROPE:

Later versions of the mouldboard plough could plough deeper. The plough therefore turned the fortunes of farming in Europe on its head. Suddenly, fields with heavy, rich and moist clay soils yielded the most. The economy of northern Europe's agricultural areas improved, and larger cities with more people and more trade grew up in the region.

Plough was upgraded

1 Originally, the mouldboard plough had no wheels, but they were added on later versions, making the plough more stable and easier to steer. The heavy plough required a lot of traction, provided by up to eight animals.

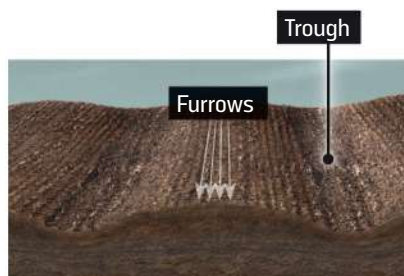
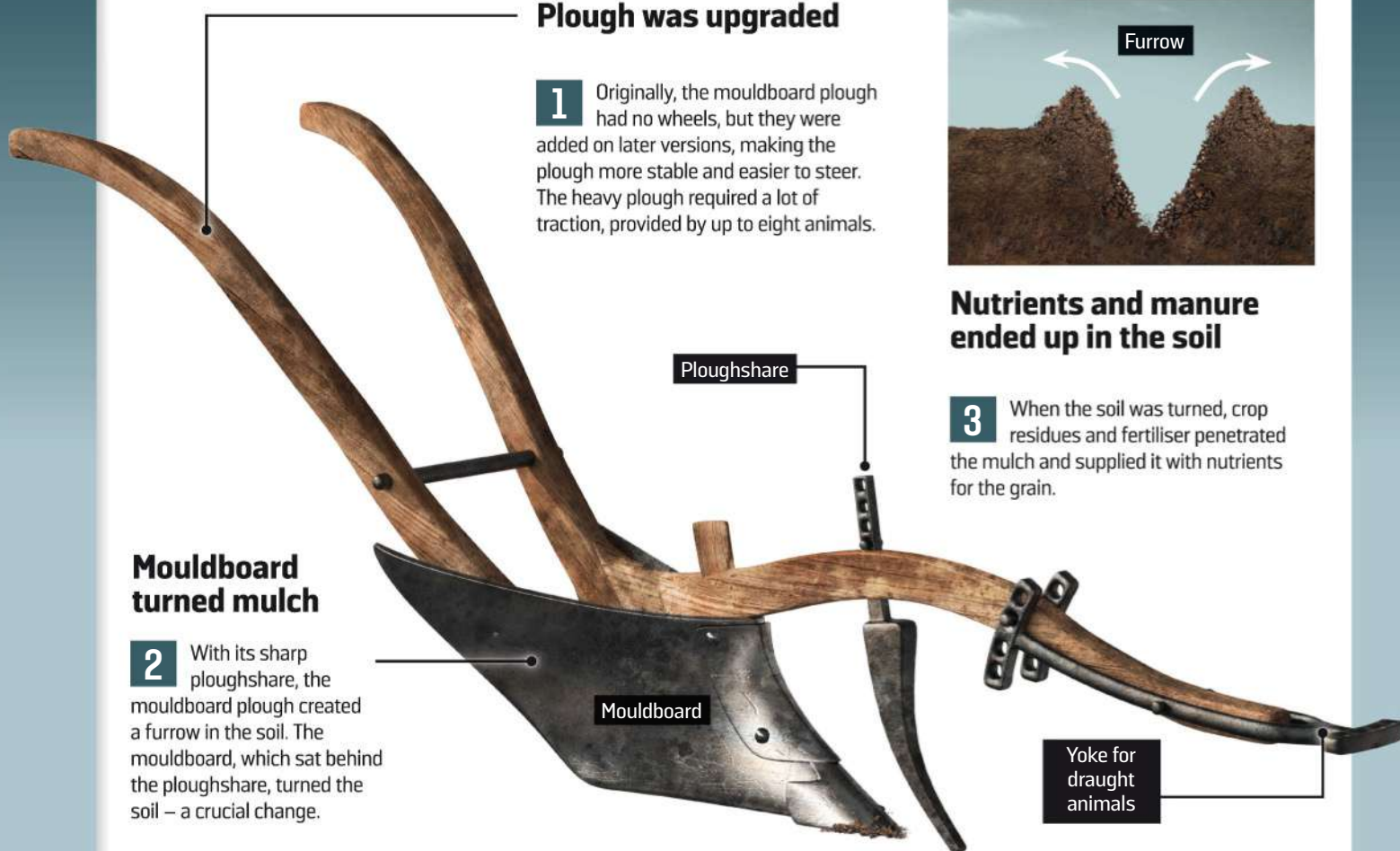


Nutrients and manure ended up in the soil

3 When the soil was turned, crop residues and fertiliser penetrated the mulch and supplied it with nutrients for the grain.

Mouldboard turned mulch

2 With its sharp ploughshare, the mouldboard plough created a furrow in the soil. The mouldboard, which sat behind the ploughshare, turned the soil – a crucial change.



Ploughing created ridges, where the furrows were at different heights. This ensured a more stable harvest.



In particularly wet summers, rain collected in the troughs. In this way, the peaks stayed drier and the grain wasn't saturated.



Dry summers produced grain in the troughs of the ridges, where the scarce rain and other precipitation accumulated.

New method boosted crop yields

Crops need 16 nutrients to thrive and grow. The main ones – carbon dioxide (CO_2), hydrogen and oxygen – come from the atmosphere and water respectively. Together, these three nutrients make up 92–99 percent of organic plant matter. The remaining nutrients – such as nitrogen, potassium and phosphorus – are supplied

to crops through the soil. Although the proportion of nutrients from the soil is small, it is crucial for plant growth and well-being. Fertilising the soil – for example, by spreading animal droppings on the field or by ploughing plants and weeds into the soil, as with the mouldboard plough – significantly increases the nutrient content.

THE PERFECT SOIL:

Perfectly nutrient-rich soil contains a healthy mix of sand and clay: in short, the soil contains enough sand to ensure good air circulation and enough clay and organic matter to hold water and nutrients, so that plant roots can take advantage of the nutrients. If the soil is too sandy or too loamy, yields drop quickly.



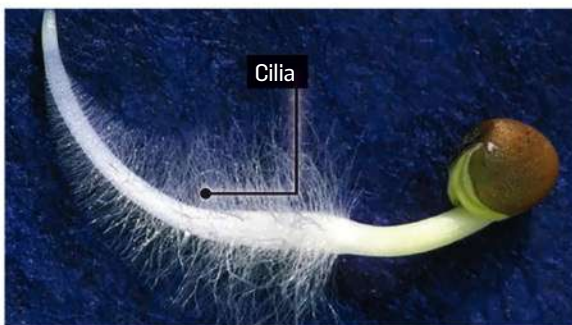
Plants and soil

- 1 Fertiliser in the form of animal droppings and plant remains contains nutrients. The mouldboard plough churns the fertiliser and its nutrients into the soil, ensuring that they are mixed effectively with the earth for the benefit of the crops. The result is better yields.



Leaves absorb energy from the sun and ensure plant growth

- 2 Using the sun's energy, the plant can combine carbon dioxide and water to make glucose and oxygen. Glucose can be converted into starch, which, together with the nutrients from the soil, is built into all the other substances that make up the plant.



Roots absorb water through small hairs

- 3 At the tips of the plant's roots grow cilia – thin hair-like projections on the root's outermost cells. The hairs provide the roots with a very large surface area through which to absorb water and nutrients from the soil.

Salts and minerals absorbed from soil

- 4 Through the root hairs, the plant also absorbs nutrients such as nitrogen, potassium and phosphorus salts, which can be broken down into ions. The ions pass through the roots and up into the plant.



flexible, both to cope with the work on the farm and to be able to take part in the wars to which they were summoned by the chieftain.

Descriptions of how this training took place can be found in the sagas, which tell how the Vikings regularly competed against each other to train and maintain their strength and warrior skills. For example, the Icelandic author Snorri Sturluson tells how young men held swimming competitions, where the aim was to keep the opponent under water until he either gave up or drowned.

Norse were well groomed

The active lives of the Vikings are reflected in their skeletal remains, but examination of Norse bones also revealed something surprising.

Modern depictions of Vikings often portray the men as being very masculine and the women as extremely feminine. This was not the case, at least not when it came to faces, scholars say. The facial features of men and women in the Viking Age were actually far more similar than they are today.

Researchers sex skeletons by examining the pelvis, which is wider in women than men. They then cross-check the results by comparing the width of the pelvis with the features of the skull. Men's jawlines and eyebrow arches are usually

more prominent than women's, but in Vikings, the difference is less pronounced.

Historians do not yet know why. The skeletons do not reveal what the Norse looked like, but through other finds and accounts, researchers can come closer to describing the Viking's appearance.

Academics believe that the Vikings' skin colour was similar to that of modern-day Scandinavians, while hair colour varied from dark to very blond. Genetic analysis reveals that blond hair was predominant in northern Scandinavia, for example, around present-day Stockholm, while **red hair** dominated further south, in places like Denmark. While research can more or less reveal the average Viking's physique, Nordic hygiene habits pose more of a headache for historians. It was long thought that the Norse were dirty and unkempt. The Arab diplomat ibn Fadlan, for example, who met a group of Vikings on the Volga River, described the Scandinavians as "the filthiest of God's creatures". However, finds of combs, nail cleaners and other personal hygiene equipment suggest that the Vikings were clean and meticulous about their appearance.

This view is confirmed by a thirteenth-century chronicle attributed to the English monk John of Wallingford. The Vikings, Wallingford said, ►

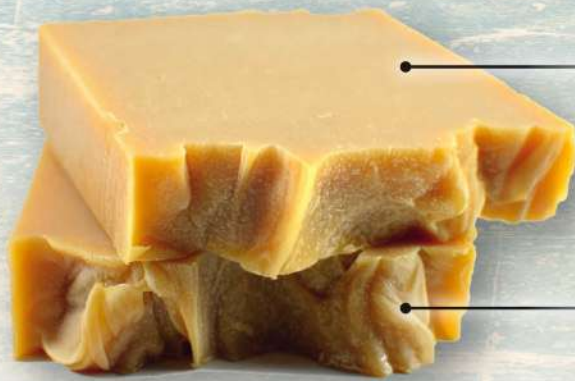
RED HAIR

is more common in people from northern Europe, where, around 2-6 percent of the population has red hair.

Saturday was bathing day in Scandinavia, and the ablutions took place in everything from bathtubs to lakes and rivers.



Hygiene | Strong soap



SOAP bleached the Vikings' hair and beards, giving it a distinctive blond colour.

ANIMAL FAT
Soap could be made from sheep fat and ash boiled in plenty of water.

regions, preferably from Byzantium. Strong colours such as bright red and blue signalled power and status. Blue, in particular, was a noble colour. The colour was made from the Nordic plant woad or – when it had to be especially fine – from the dye indigo, which was imported.

The ordinary Viking dressed in wool and linen. Fabric was often woven at home on the farm, a task that took a long time and a lot of work. Tests show that a standard shirt required about ten kilometres of hand-spun yarn and the

spinning itself took about 200 hours.

In addition to spinning, the flax had to be picked, the fibres carded and the yarn dyed. Dyeing was done by boiling the yarn with plants that released different colours, such as yellow, red and purple. Clothing production was not the only duty of Viking women. The woman was responsible for everything to do with the home, such as cooking and childcare. She was also in charge of managing the family's finances when the husband was away on business. From the moment the ship slipped out of the fjord, the housewife had to manage the children, the elderly and the servants to ensure the harvest and thus the survival of the whole family.

Farms grew significantly

Both written and unwritten rules and the fixed rhythm of the farm ensured stability, allowing agriculture to develop, while the hard work of the Norse and the mouldboard plough ensured growth. Archaeologists know from excavations that farm settlements grew from AD 700 to 1000.

In the Danish village of Vorbasse, for example, the number of farms was constant throughout the Iron Age and the Viking Age, but in the Viking Age, the farms covered a much larger area than before. And around the year 1000, the number of farms more than doubled. Archaeologists have found that many people lived in each house.

This population growth provided the basis for further development of Viking society. Towns grew in size and wealth. Increased cultivation of the land also led more Vikings to leave the countryside. Younger sons of the family, who were not likely to inherit the farm, looked to distant horizons and travelled as traders or warriors to gain wealth and glory in foreign lands. ■

were so inviting to look at that they seduced even the finest English women with the greatest of ease.

“They were – according to their country's customs – in the habit of combing their hair every day, bathing every Saturday, changing their clothes frequently and drawing attention to themselves by means of many such frivolous whims. In this way, they besieged the married women's virtue and persuaded the daughters of even noble men to become their mistresses,” the chronicle relates.

The habit of bathing has left its mark on the Danish language. In Viking times, the day was called *laugardagur* or *løverdag* – an old Norse word for washing day, which later became *lørdag* (Saturday). The difference in opinion between ibn Fadlan and the English monk, researchers say, is because the Arab observer came from a Muslim culture, where the norm was to wash five times a day, while the English and Norse found it sufficient to cleanse the body thoroughly once a week.

Fashion was international

Viking women probably had long hair, sometimes tied up in a bun, historians surmise from the discovery of small female statues. Figurines, murals and woodcuts also tell archaeologists about Viking clothing. While the men wore trousers and a tunic, the women wore a pinafore dress.

Determining the material used is more difficult, as fibres decay. Only under very special conditions are larger pieces of cloth preserved. Otherwise, historians rely on analysing the tiny fragments of fabric that have survived – in graves, for example, or as deposits of fibres on the backs of jewellery.

Archaeologists know from finds that the upper classes demonstrated their wealth by adorning themselves with silk and gold threads from distant

Vikings were skilled farmers

- The Vikings **expanded the cultivated area** of the Nordic countries.
- The **housewife was an important and valued member of the family** and enjoyed extensive rights, for example in connection with divorces.
- The Norse **used advanced cultivation methods** that made farming more efficient and enabled them to grow winter rye, for example.
- The Vikings were **self-sufficient** and able to survive the winters.

200

hours was the length of time it could take to weave a shirt. The Vikings found the time in the dark winter months especially, when raiding and farming quietened down.

? WE NEED ANSWERS

How many slaves lived in the settlements?

1 Researchers now believe that the use of thralls was even more widespread than previously thought, and that some farms **functioned almost like Southern slave**

plantations. The slaves were largely brought in from outside following a raid. The role of slaves is largely unexplored, and excavations are still limited in number. Researchers therefore know

little about the extent to which farmers used slaves and how many of them lived in the settlements.

Did Vikings make their own wine?

2 The Vikings grew vines, according to discoveries of grape seeds at the manor at Tissø on Zealand. **However, researchers do not know whether the grapes were used to make wine.** They will only be able to solve the mystery if more grape seeds are found.

What were keys used for?

3 Historians have long believed that married Viking women carried keys as part of their personal equipment. **The key symbolised the woman's role as housewife** and the resulting power over the household economy. The assumption is based on a number of finds in Viking women's graves, and the fact that housewives in the Middle Ages held the keys to the home. However, recent studies show that only about five percent of all women's graves contain keys. The richest graves contain no keys at all. Closer studies also show that the keys were not functional. Some historians believe that the **key should instead be seen symbolically** and the bearer perceived as a wise woman with special abilities, such as being able to see into the future. Whether this is correct, historians do not yet know.

In the past, scholars were certain that the key to the home belonged to women. Now they're not so sure.





For 400 years, the Vikings explored the world – discovering new places where no Europeans had travelled before.

TOWARDS UNKNOWN WORLDS

The Vikings travelled far and wide, from north (Greenland) to south (North African coast), and from east (Russia) to west (North America). But the questions of how far, why and how remain unanswered. The truth is sought in Russian chronicles, walrus tusks and strange finds in Newfoundland.

Ermentarius was a troubled man. As a monk and historian at St Philibert's monastery on the island of Noirmoutier off the west coast of France, he'd hoped that life would unfold as it usually did for monks in the ninth century AD – as a series of quiet days, filled with prayer and work. But it was not to be.

In AD 799, savage Norsemen attacked the monastery for the first time. The raid would not be the last. Again and again, Vikings plundered the sacred buildings, and from 819, Ermentarius and the monastery's other monks were forced to move to the mainland during the summer months to avoid the bloodthirsty warriors.

A few years later, the monks gave up. They abandoned the monastery, moved inland and left the buildings and the island to the Vikings.

"The number of ships increases, the endless flood of Vikings never ceases to grow bigger. Everywhere Christ's people are the victims of massacre, burning, and plunder," Ermentarius wrote despairingly in the monastery's chronicle.

To Ermentarius and his kind, the endless stream of ships from the north must have seemed unimaginable. Who were these Vikings, and what

drove them to distant lands thousands of kilometres from their home? The questions are many, and some remain unanswered, but what is certain is that the Vikings quickly became increasingly daring.

From exploring relatively close to home via rivers and along coastlines, the Norsemen ended up crossing oceans to settle in some of the world's most desolate regions. The answers to how and why must be looked for in chronicles, ancient finds and using the latest expertise. And although the story begins in France, the Vikings travelled much further afield.

“The number of ships increases, the endless flood of Vikings never ceases to grow bigger.

Ermentarius, French monk

All corners of the world

After their raid in 799, the pillaging continued to increase in strength and range. Throughout the ninth century, Vikings plundered and ravaged monasteries, trading hubs and towns in the area that makes up modern-day France, Germany, Spain and the Netherlands.

And soon the Vikings travelled further afield. In 859, a fleet sailed through the Strait of Gibraltar. Academics know about the Vikings' passage from an account written by the Arab historian Al-Bakri. The scholar tells of a Viking attack on the Moroccan state of Nekor, where the northerners defeated a Muslim fleet around 859-860. Al-Bakri says that the "fire-worshippers" captured Africans. The word is used in the Arab world ➤

NOIRMOUTIER

is located near Nantes on the west coast of France. The monastery on the island was founded in 674 and still exists.

AL-BAKRI was an Arab historian and geographer born in Andalusia in present-day Spain.

to refer to pagans, and although historians still debate whether **Al-Bakri's** account is about Vikings, most believe that the description of the attacks and the capture of slaves shows a definite link to Viking raids. The Norse then ravaged the coast of present-day Morocco, capturing "blue men", as they called Africans, before sailing east into the Mediterranean to plunder the Italian peninsula. Afterwards, according to some accounts, the Norsemen sailed on as far as Alexandria in Egypt.

Further east, Norsemen travelled along the Volga River and into present-day Russia. The voyages to Russia in particular – unlike the later colonial adventures to Greenland and America – are quite well documented. There are, for example, the Varangian rune stones, which tell of Vikings who travelled east. The stones were mainly erected during the eleventh century, but at least one dates from the eighth century. It stands in East Gothland in the south of Sweden, and has the following inscription:

"Styggv made this monument in memory of Eyvindr, his son. He fell in the east."

These Vikings were called Rus', which historians believe derives from *ruotsi*, the Finnish name for

Sweden. It first appeared in both European and Arabic sources around 840, but the history of the Vikings in Gårdaríke, as the area now comprising present-day Russia, Ukraine and Belarus was known to them, goes back even further. The Swedes had already spent a few hundred years exploring along the Baltic Sea for trading opportunities in what is now Latvia and Lithuania. In search of good trading posts, the Vikings sailed south up the Volkhov River to the town of Ladoga, which they made their capital in 862. The town, renamed

Staraya ('old') Ladoga in 1704, is one of Russia's oldest and – according to the earliest Russian chronicles – served as a template for those that followed. Today Ladoga is an idyllic village in the heart of the Leningrad Oblast.

"You climb to the top of a hill and look out over one of the most

beautiful Russian landscapes. The mighty grey Volkhov River flows with rapids and sandbanks where the current is strongest ... The dark green forests seem to frame the picture," wrote Russian writer and painter Nicholas Roerich of the view from the north towards Ladoga in the early 1900s.

The landscape was probably not that different when the Vikings docked here to provision

The Swedes had already spent a few hundred years exploring along the Baltic Sea for trading opportunities.

Insight | The Viking Rus' kingdom

According to the sagas, in 862 the Viking Rurik secured control of the town of Ladoga near Novgorod. From there, the Vikings and their descendants spread, coming to rule over large parts of modern-day Russia.



RURIK arrived in Ladoga with his brothers Sineus and Truvor. The men settled in Ladoga, but a few years later moved their base to Novgorod, from where they ruled the Rus' kingdom.



ASKOLD AND DIR, two of Rurik's men, were ordered to travel to Constantinople, but instead settled near Kiev, where they founded their own Viking kingdom.

themselves with dried meat and fish, and take on board traded goods before setting off on the perilous return journey downriver.

Silver lured the Vikings east

Like Ermentarius, Ladoga's inhabitants also experienced growing numbers of Viking visits. Historians don't know exactly why the incursion suddenly exploded in size but do know that the Viking empire grew rapidly in the late ninth century, when the Norsemen conquered the city of Kiev in what is now Ukraine. The ruler, Prince Oleg, proclaimed the city "the mother of Russian cities" and, with Kiev as his new capital, Oleg controlled three important trade routes – one to the Baltic Sea, plus a second to the Caspian Sea and Baghdad, from where goods flowed from the Middle East and central Asia. A third route led to the Black Sea and on to Constantinople.

The goods literally flowed with the river into the city. From the Slavic tribes to the south and east came furs, honey, amber, weapons, wax and slaves. From Arabia and Byzantium to the south came gold, silver, silk and spices, along with luxury goods brought by caravans from even further east.

Norse craftsmen settled in the city to produce objects made from bone or carved from wood, as well as footwear, glass beads and wrought iron, which they sold to the local population. In return the craftsmen bought food and raw materials such as bone, wax and fur. The Vikings sold some of the fur at the town market in exchange for Arab silver coins. Those turning a tidy profit no doubt returned

Commodities | Amber

NORDIC GOLD

Amber was worked to make jewellery, playing pieces and decorative objects.

IN HIGH DEMAND

Amber was a key commodity, and found across Europe.



to Scandinavia with leather bags full of shiny coins. Historians guess that the tale of the East was told again and again in the long winter evenings when the family gathered around the fireplace.

We can't know for sure, but at the very least the rumour reached the Vikings' relatives back home in Scandinavia that Ladoga was a silver gateway to the treasures of the East.

The tales of the promised land encouraged even more northerners to set sail eastwards ➤



OLEG was most likely Rurik's brother-in-law. He inherited Rurik's kingdom, killed Askold and Dir, and thus created a large, united Viking kingdom in Russia.



IGOR took power in the Rus' kingdom in 912. He was the son of Rurik and ruled until 945, when he was killed while collecting taxes from the local tribes.

and may also have encouraged them to seek other golden opportunities far from Russia. At the same time, Vikings started to sail north and west to Iceland and Greenland, for example.

New boats made voyages possible

Over the course of a single century, Viking trade and plunder had spread across the European continent and deep into present-day Russia. Everywhere, the Norsemen were feared for their ferocity and prowess on the battlefield, but the driving force behind this massive expansion lay in the most important innovation of the Viking Age: the longship.

Viking Age ships differed greatly from the boats in which the Norse had sailed in the past. Scandinavian ships had traditionally been long, slow, heavy and clumsy. As late as the seventh century, vessels were crudely built from long, thick planks that made them rigid and inflexible on the one hand, but not strong enough to support a mast on the other, due to the weakness of the keel. These boats, therefore, had relied on rowing power.

But around 700, Nordic shipbuilders developed the ability to fit several shorter planks of wood together using nails. It was a technological quantum leap, and how the Vikings suddenly mastered this new skill remains a mystery. Present-day historians believe that the inspiration for the new clinker-built boats – ships in which several shorter planks were laid overlapping each other like roof tiles and nailed together – came from the south. In the countries around the Mediterranean, sailors had been sailing in clinker-built ships for many hundreds of years,

and throughout the Iron Age there was a lively trade between the Germanic tribes, to which Denmark belonged, and the Roman Empire. A key piece of evidence to support this theory was found by the teacher and amateur archaeologist Conrad Engelhardt in 1863, when he came across a metre-long clinker-built boat in Nydam Bog, just north of Sønderborg. Archaeologists discovered that the **Nydam ship**, which looks like an early version of a Viking ship, was built between AD 340 and 360.

The boat probably belonged to a Germanic tribe that sailed to Denmark from the south to plunder or wage war. The boat was, researchers believe, cast into the bog as a sacrifice to the gods in thanks for victory over the tribe to which the boat belonged.

“Comparisons indicate the earliest remnants of clinker-built boats of the North ... figure an amalgam of prehistoric Northern European skills and Roman techniques adopted and modified respectively by local boat builders,” Ronald Bockius of the Roman-Germanic Central Museum in Mainz told a symposium in 2012.

In other words, contact with the Germanic tribes and the Romans gave the Scandinavians new ideas that would prove to be critical to their future boat-building endeavours.

Ship was light enough to be carried

The new way of building boats had other benefits: the ship's sides became more flexible, and it also became considerably lighter, enabling the crew to carry it over short distances if they encountered an obstacle on the waterway. At the same time, the Norse discovered how to build a strong, ➤

NYDAM SHIP
is a three-tonne, 23-metre-long oak boat, built in clinker, representing a stage of development between early Nordic boats and the Viking ships proper. The boat is now on display at Gottorf Castle in the German city of Schleswig.

The first ... colony

c. AD 862

Viking chief was headhunted by locals

The boundaries between a Viking settlement and an actual colony were blurred, but the Viking chieftain Rurik founded one of the earliest and most viable Viking kingdoms, the Rus' principality. According to Russian chronicles, Rurik, together with his two brothers, was elected ruler by the local Slavs, who preferred the foreign chiefs to local magnates.

Historians believe the story has been greatly embellished. It's likely that Rurik and his warriors managed to exploit internal strife among the Slavs to their own advantage and thus came to rule over the local population. The Viking kingdom lasted until the thirteenth century, when the Mongols conquered the area.



Rurik is still celebrated in Russia. To mark the thousandth anniversary of his arrival, Novgorod unveiled this statue.



This fifteenth-century map of Vinland shows the extent of the Viking Empire. Greenland, Iceland and parts of North America are drawn in.

The man on the left is the victim of a myth. Viking helmets did not have horns. The rest of the painting is relatively historically accurate.

Vikings settled in all corners of the known world



Greenland

Greenland (982): According to the sagas, Erik the Red founded Greenland in the late tenth century. The Vikings established two settlements on the southern tip of the island, where the weather was mild and the land fertile. The Vikings probably left Greenland in the early fifteenth century, when the climate became colder.



Iceland

Iceland (850): Was uninhabited save for a few Irish monks when the Vikings arrived. At least 25,000 Norse eventually settled here and in 930 founded the Althing, the world's oldest parliament. In 1264, the Norwegian crown took control of Iceland.

Faroe Islands (800):

In the ninth century, Norwegian Vikings displaced Irish monks who had lived on the Faroes since the seventh century. There were around 4,000 people living on the islands in around 1300.



Faroes

Danelaw (886): Vikings set out in 865 to conquer England, settle and farm the land. By 886, they ruled over 15 shires, which collectively covered a large part of northern and eastern England. The term 'Danelaw' was first recorded in the early eleventh century to describe a geographic region where the laws of the Danes held sway.

America

America (1001): The Viking Leif Eriksson – called Leif the Lucky after he rescued a group of shipwrecked sailors – is said to have sailed from Greenland to America. Historians do not know where the Scandinavians landed or how long they stayed. Archaeologists have established that Vikings lived in the settlement of L'Anse-aux-Meadows in Newfoundland but are convinced that they lived elsewhere on the continent, too.



ATLANTIC OCEAN

England

Normandy

EUROPE

Duchy of Normandy (911): In 911, the West Francian king Charles the Simple made the Viking leader Rollo Count of Rouen. In return for the title and a large territory previously plundered by the Vikings, Rollo was to serve Charles as a vassal. The Norman language, still spoken in Normandy, retains Danish elements.

Alps



Viking colonies flourished from Vinland to Russia, and from Greenland to France. Some were given to the Norsemen by local rulers, other territories were won by force.



Russia (882): Vikings navigated the rivers into present-day Russia, conquered Novgorod and Kiev, and founded the principality of Rus'. The kingdom lasted until 1223, when the Mongols conquered the area.



massive keel that could hold a mast, and from around 800, sails became standard on ships. The Viking longship was born, and in more ways than one, it was a prerequisite for Viking success. The ship's lightweight construction was crucial for the Vikings heading east. En route, they often had to carry the ship as they crossed from one of the area's many rivers to another.

The *Nestor Chronicle* – written in Kiev around 1100 – and the Byzantine Emperor Constantine VII's work *De administrando imperio* from 950 both mention Viking navigation, and each related how the Vikings pulled ships overland to bypass the worst rapids.

The agile vessels made it possible to sail far, whether trading goods or conquering new territory. When looking for targets, the Vikings used the same tactics as for pillaging: surprise attacks using the fast, manoeuvrable ships that were capable of sailing close to the coast to land warriors.

Ships' holds were filled with slate

The Vikings' modern ships were exceptional in that they could be used for more than navigating rivers and performing lightning attacks along the coasts of Europe. During the ninth century, the Norsemen began to build bigger and wider boats. These spacious vessels were good for trade, as the large holds enabled them to transport more goods – including heavier items such as slate from Norway and basalt grindstones from the Rhine area. The wide-hulled ships did not require a large crew and were often owned by a merchant or several such traders, who shared the cost of constructing and running them.

The huge ships also made it possible for the northerners to sail greater distances. The vessels were stable and spacious enough for the Vikings to even transport large numbers of people, livestock and goods. The largest transport ships were ocean-going and could carry at least 50 tonnes of cargo.

These cargo ships became central to the voyages north and west that began during the ninth century. Here the Vikings sailed to the Faroe Islands and Iceland, where they settled. And in the 980s, the Norse landed in Greenland. Here they founded two colonies: *Østerbygden* (Eastern Settlement) and *Vesterbygden* (Western Settlement), both on Greenland's southern tip. Archaeological finds reveal the Vikings stayed for more than 400 years.

The colonial adventure in Greenland is an interesting one for historians to delve into. At ►

” As late as the seventh century, Viking boats were being crudely built from long, thick planks that made them rigid and inflexible.



In 874, the Norse Ingólfr Arnarson ordered the construction of the first permanent Viking settlement in Iceland, where Reykjavik now stands.

first sight, it may seem incomprehensible that the Vikings chose to settle in these cold, barren regions so far from home. Something must have piqued their interest in Greenland, while it's probable that the conditions for survival in Greenland were different from today. We know where the Vikings settled because the sagas tell us, and archaeological finds have since confirmed these early settlements.

Archaeologists have found the remains of around 500 farms from the Viking Age in the Eastern Settlement, all located along the coast. In the Western Settlement, the remains of approximately 100 farms dating from around 1000 to 1300 have been found.

In the 1920s, Danish archaeologists Poul Nørlund and Aage Roussell excavated a settlement at Brattahlíð (now Qassiarsuk) where, according to the sagas, Erik the Red settled. The pair found no buildings from the Viking Age, but in 1960 other archaeologists uncovered a cemetery with approximately 150 skeletons. The dead were buried around a small church made from peat.

The researchers examined nine of the skeletons and dated them to the period between 1000 and

1200. Some historians believe that the building was the church built on the site by Erik the Red's wife, Thjodhild, according to Erik's saga.

Historians have wondered why the Vikings chose to settle so far north. However, scientists have concluded that the climate during the Viking Age was somewhat milder than it is today. This has been determined by studying tree rings, deposits in lakes and ice samples from the great ice sheets of Greenland and Antarctica.

Scientists analyse the ice cores by examining particles hidden within. Newly fallen snow contains a lot of air. When it's compressed into ice, some of the air is trapped as bubbles inside it. The bubbles contain particles such as pollen, volcanic ash and dust. By comparing the findings with known **events – such as a major volcanic eruption – they can date the individual layers. Because the layers are different in summer and winter, scientists can track the climate through time – for example, by observing how much ice forms in each year.**

Scientists analyse tree rings and deposits in lakes using the same method. The size of the tree rings depends on the climate; mild years produce wide rings, while cold years with poor conditions for growth show up as narrow rings. Layers of pollen in the lakes show which plants have enjoyed good conditions during those years.

Growing barley in Greenland

During the Viking Age, Greenland's southern tip was warmer than it is today and was relatively fertile, with plenty of farmland for the Vikings to cultivate. According to the medieval book *Konungs skuggsjá* (*The King's Mirror*), a textbook on trade, war, politics and morality that was written in the 1250s for the future Norwegian king Magnus Lagabøte, the Norse could grow grain just like at home in Scandinavia. Scientists were long sceptical of the claim, but in 2012 archaeologists unearthed proof in the form of small, charred corn kernels hiding in a midden on the island. The grain is barley, and scientists know that it was grown in Greenland ➤





Lead in tusks reveals ancestry

Historians have long tried to find out what drove the Vikings to settle in Greenland. They speculate that the lucrative trade in walrus ivory was a key factor. The theory can be proved by a relatively simple technique that compares the number of lead isotopes in the sea off Greenland with those in walrus tusks found in Europe.

To determine whether Greenland's Vikings extensively traded walrus ivory, scientists need to know where the tusks originally came from. To do this, geologists analyse lead accumulated in the ivory. **The lead in water has different isotope values depending on the geology of the area**, and walruses absorb the lead when they eat molluscs such as mussels. **By comparing the lead isotopes in walrus tusks with the lead isotope values in the sea around the Viking settlements in Greenland, scientists can determine whether the tusk is from Greenland.** The geologists' preliminary results show that a massive proportion of jewellery and ornaments from Europe is made from Greenlandic ivory. Everything therefore suggests that the trade in walrus tusks played a major role in the Vikings settling in Greenland.

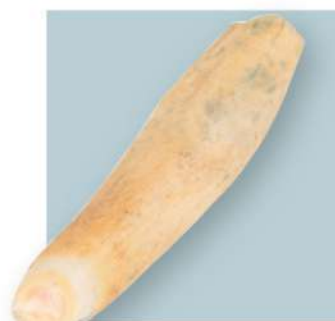
Seawater sample

1 Archaeologists measure lead isotope levels in the sea around the main Viking settlements – for example, in Disko Bay. The technique is also used in Iceland, where this photo was taken.



Sample from tusk

2 Scientists use a drill to take samples of the 1,000-year-old walrus's tusk. To prevent possible contamination from the drill, archaeologists place the samples in an acetic acid bath for around ten minutes.



Comparison

3 Researchers then measure the lead isotope value in the walrus tusk and compare it with the values from the seawater. If they are the same, the tusk came from Greenland.



With a walrus weighing up to two tonnes, its tusk can grow to a metre long and weigh over 5 kg.



because it was not threshed, as it would have been if it had been shipped in from Scandinavia. Whole barley was too large to be transported in even the largest and most spacious Viking ships.

The grain enabled the Vikings to cook porridge, bake bread and brew beer just as in the Nordic countries. In other words, the Norse carved out a reasonable existence in Greenland, and to their surprise, researchers have discovered that the Viking population on the island grew on average two centimetres taller than those living back home in Scandinavia. Indeed, the population of Greenland expanded steadily during the first decades after the Vikings' arrival. In the first half of the eleventh century, the population of the colony numbered around 5,000 people.

But were promises of good food and plentiful supplies of beer enough to lure the Vikings on a 2,000-kilometre voyage across the windswept Atlantic? Or did other, more profitable, ventures in the tenth century draw the Vikings north?

Ivory of the North

Some researchers believe that the attraction of Greenland lay not in the soil and landscape of the far northern island, but in the warm halls of Europe's museums of art and culture. Here, you'll find large quantities of objects made from walrus tusk, a material similar to ivory and suitable for carving.

Ivory from elephant tusks was highly sought after in early medieval Europe, but the price of the teeth, which had to be imported from the African savannah, was sky-high. Walrus tusks are almost identical to elephant teeth, and the abundant

supplies from the Vikings' wide-bowed transport ships from Greenland helped keep prices affordable. The fine material quickly became popular for carving chess pieces, jewellery, saints' wreaths and other pieces of art.

The ivory artefacts are now distributed in museums throughout north-western Europe, including Britain, and most of the works were made around the year 1000, the period immediately after Vikings settled in Greenland. Could it be that the Greenlandic walrus – including its tusks – encouraged Vikings to brave the cold and the waves of the Atlantic to settle in the north?

Karin M Frei, senior researcher at the National Museum of Denmark, and Søren Sindbæk, professor of medieval and Renaissance archaeology at Aarhus University, investigated the hypothesis in 2015, and preliminary results suggest that there may be something to it.

Using isotope analysis, a method that makes it possible to determine

where in the world material such as teeth come from, Frei has discovered that some of the walrus ivory used for the finely crafted objects in Europe's museums actually originated in Greenland.

A 2018 study by University of Cambridge archaeologist James Barrett supports the theory. Barrett examined DNA from walrus skulls found in rubbish heaps at medieval trading centres such as Dublin, Bergen, Oslo, London and Sigtuna in Sweden. His findings show that the majority came from Greenland.

The tusks were only removed after transport, so it's likely that the DNA of the skulls matches the genetic material in the museum artefacts. ►

“Ivory from elephant tusks was highly sought after in early medieval Europe, but the price of the teeth was sky-high.”

Vikings built ships for war and for trade



THE DRAKKAR was a warship and the warlord's flagship.

Warships were divided into classes according to how many oars the ship had. Drakkars were the largest in the class, with 60 or more oars. The ship was fast and manoeuvrable, making it suitable for attacks close to shore.



THE KNARR had a wide, rounded hull and lay deep in the

water. The vessel was slow but stable and therefore ideal for transporting goods, livestock and people over long distances, for example to Greenland. Knarrs could probably carry 40–50 tonnes of cargo.



THE SNEKKJA was a small warship

rowed by around 20 men. The slender vessel was the Vikings' most widely used and ideal for sailing in inland waters as well as for navigating the Baltic Sea. The ship was also extremely light and flat-bottomed.



THE FAERING ("FOUR-OARING")

was a small boat powered by two rowers, each utilising a pair of oars. Some of the boats also carried sails. The faering was used to both transport people and objects, plus could also be deployed as a fishing vessel.

Viking ships could sail in all waters

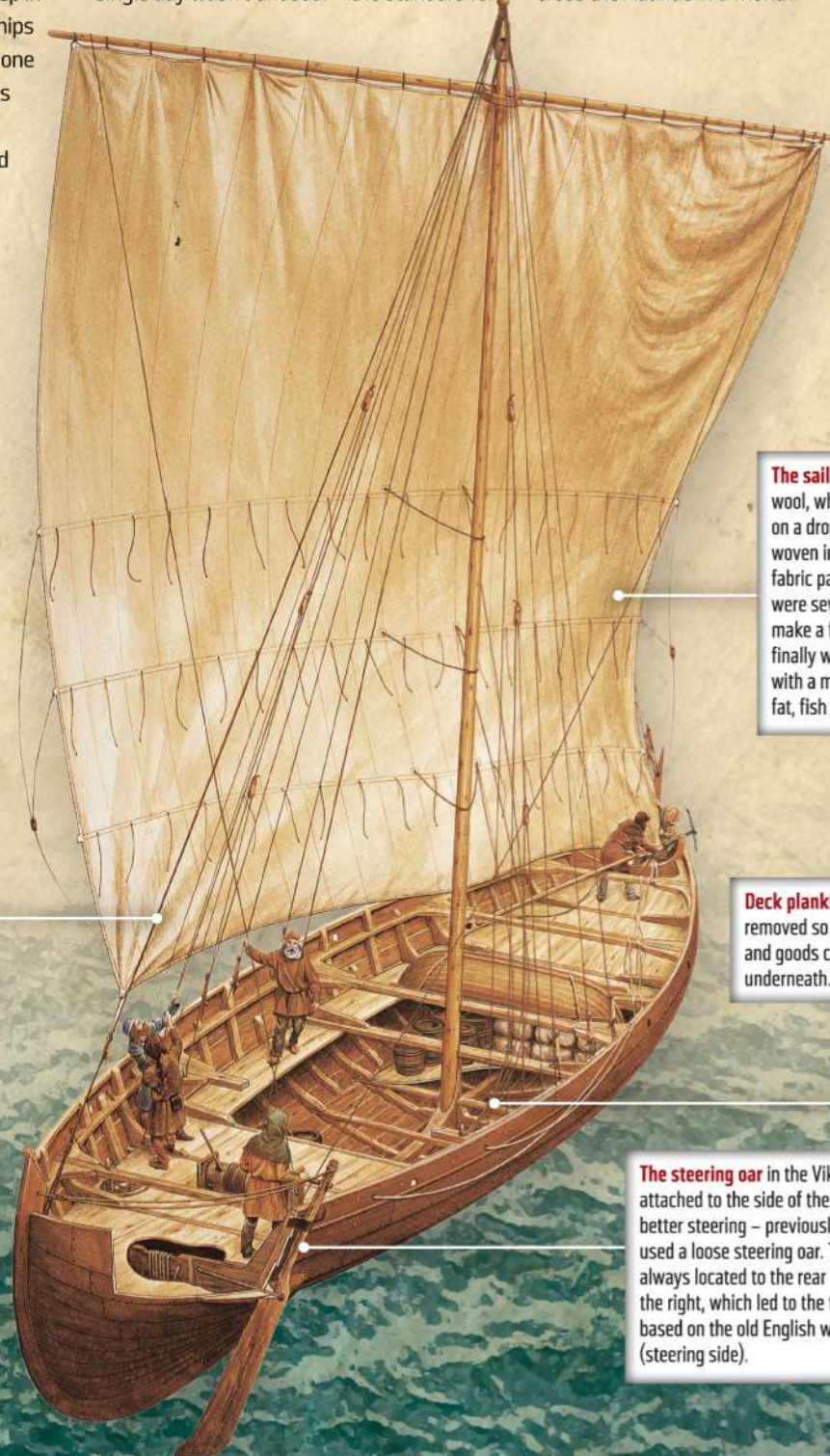
From the rivers and narrow fjords of Scandinavia to the Atlantic waves, Viking ships were built to sail anywhere.

A Viking ship's construction made it a versatile vessel. In the Nordic fjords, rivers and streams, the ship was used for local transport because it did not sit very deep in the water. Thus, some of the smaller ships could sail in water with a depth of only one metre, while even the very largest ships could manoeuvre in just three metres of water. This meant that the ship could travel close to shore when the Vikings needed to load and unload goods or surprise an enemy.

The large transport ships sailed exclusively by sail, while the slender longships – the warships – also had oars. By adjusting the sail, the Vikings could travel against a headwind by tacking. For warships, however, the fastest way was often to simply lower the sail and row. As ocean-going ships, Viking ships were unrivalled. To test the ships' sailing abilities, researchers built replicas and sailed them along Viking routes. We know from these voyages that the great transport ships were both seaworthy and fast. One survived a

storm with waves of 12–14 metres without any problems and reached a speed of 13 knots (25 km/h). Travelling 370 km in a single day wasn't unusual – the standard for

an early twentieth century sailing ship. Under favourable conditions, a Viking ship could sail from Norway to Greenland in two weeks and cross the Atlantic in a month.



Rope was usually made from horsehair or linen. Horse hair was water repellent and therefore suitable for ropes that were constantly wet. For a large Viking ship, around 600 horses had to be stripped of their tails.

The sail was made from wool, which was spun on a drop spindle and woven into 70-cm-wide fabric panels. These were sewn together to make a full sail, and finally waterproofed with a mixture of horse fat, fish oil and ochre.

Deck planking could be removed so that provisions and goods could be stowed underneath.

The steering oar in the Viking Age was attached to the side of the ship to provide better steering – previously the Norse used a loose steering oar. The oar was always located to the rear of the boat on the right, which led to the term 'starboard', based on the old English word *steorbord* (steering side).

**MYTH-BUSTER****Banishment**

Erik the Red was exiled

Greenland was discovered by accident when Erik the Red was exiled from Iceland, leaving him with no choice but to sail north and west into the Atlantic. So say the sagas, which were partly true.

The story of how Erik the Red accidentally discovered Greenland after being exiled has some truth to it. The sagas relate how in 982 Erik was brought before a jury in Iceland, accused of killing several people, including his neighbour Thorgest's two sons. The jury outlawed Erik, a harsh punishment reserved in Viking times for heinous crimes such as murder. Outlaws found themselves outside society and deprived of all the rights a free Viking otherwise enjoyed. They could be beaten, abused or killed by anyone, for example, and the punishment left the outlaw with no means to defend himself, even within the legal system, for the condemned person was considered dead in the legal sense. **His family was not allowed to help him either**, and all agreements and contracts to which the outlaw was a party were declared null and void. Everything the outlaw owned was also confiscated by the community. His wife was considered a widow, and if she gave birth to children while the man was an outlaw, the community considered them born out of wedlock. The punishment was limited to a specific period – in Erik's case, probably around three years – but while it was in force, the convict was hounded remorselessly. Enemies old and new seized the chance to settle scores. The small, closed Viking community made it difficult to hide, as it was also a punishable

offence to harbour an outlaw. For Erik, his only option was to leave Iceland. Going back to Norway may not have been practical – the family came from southern Norway, but had been forced to flee. Erik's father, Thorvald, was outlawed after being convicted of murder, just as his son later was, and the family had to leave home in a hurry and travel to Iceland.

Instead, Erik decided to explore the waters west of Iceland, but he wasn't travelling into the unknown. According to legend, a man named Gunnbjörn had been driven off course while sailing in the waters off Iceland a century earlier. When he returned home, he recounted his journey in the North Atlantic and said he had seen a land of high mountains. Erik soon found the mountain that Gunnbjörn had spoken of, but the ice made it impossible for him to sail to the coast. The Viking therefore sailed south, where he found ice-free fjords and green, lush land. Erik spent the rest of his time as an outlaw exploring the new land, which he named Greenland.

THE MYTH IN BRIEF

Norwegian Erik the Red lived in western Iceland with his wife Thjodhild, where he killed several people in a series of fights and disputes. The temperamental Viking was exiled at the subsequent trial. The sagas then state that Erik travelled west into the unknown where he discovered Greenland.



Erik the Red probably had a red beard and hair, hence his nickname.

”

The Viking sailed south, where he found ice-free fjords and green, lush land.

Erik the Red navigating through rough weather on his way to Greenland.



The high proportion of Greenlandic walrus is a strong indication that the Vikings' purpose in adventuring to Greenland was to obtain the precious commodity.

"Was it a desperate search for farmland at the margins of the known world, or was it a market-driven economic strategy applied to subarctic territory?" asked Christian Keller of the Centre of Viking and Medieval Studies in Oslo.

Cheap ivory killed the colony

The walrus is mentioned several times in contemporary writings, including *The King's Mirror*, and there's no doubt that animals played an important role in the Viking world.

The theory also fits with the fact that the Vikings seemed to lose interest in staying in Greenland during the fourteenth century. At this time, demand for walrus tusk began to decline.

The price drop came during the last quarter of the thirteenth century as Mediterranean merchants abandoned their land-based trade route into Europe and began shipping goods through the Strait of Gibraltar and the English Channel. The shipping route made it possible to transport huge quantities of ivory, and the price of the commodity fell as a result.

Because elephant ivory is easier to process than walrus tusk, which reveals a yellowish, grainy core if the craftsman cuts too deeply, European consumers switched to the real thing as soon as the price dropped enough. Falling prices coincided with falling temperatures in the north. From around 1200, Greenland's climate grew colder again.

Researchers have studied temperature changes by analysing the presence of fossils of microscopic organisms in the seabed around Viking settlements. Some organisms are typical of areas covered by sea ice, while others are typical of areas where the water is regularly whipped up by the wind.

By dating the deposits in a core drilled from the ice and then examining which micro-organisms are present in different time periods, scientists could see when the area was covered by ice and when the wind was strong. The analysis shows that winters around 1200 became colder with greater sea ice cover, and summers became windier in the bay at the time of the Viking settlement.

The cold and the climate got worse

Shortly afterwards – probably in the early fifteenth century – the Norse disappeared from Greenland. Without the trade in walrus ivory, there was no reason to remain in Greenland – so the theory

goes. It remains to be seen whether the hypothesis holds. The Norse disappearance from Greenland coincides with the climate getting colder again, so the Vikings may have moved away simply because it was too cold and they had difficulty obtaining food. However, if the walrus ivory theory is correct, the settlement of Greenland can be seen in a whole new light.

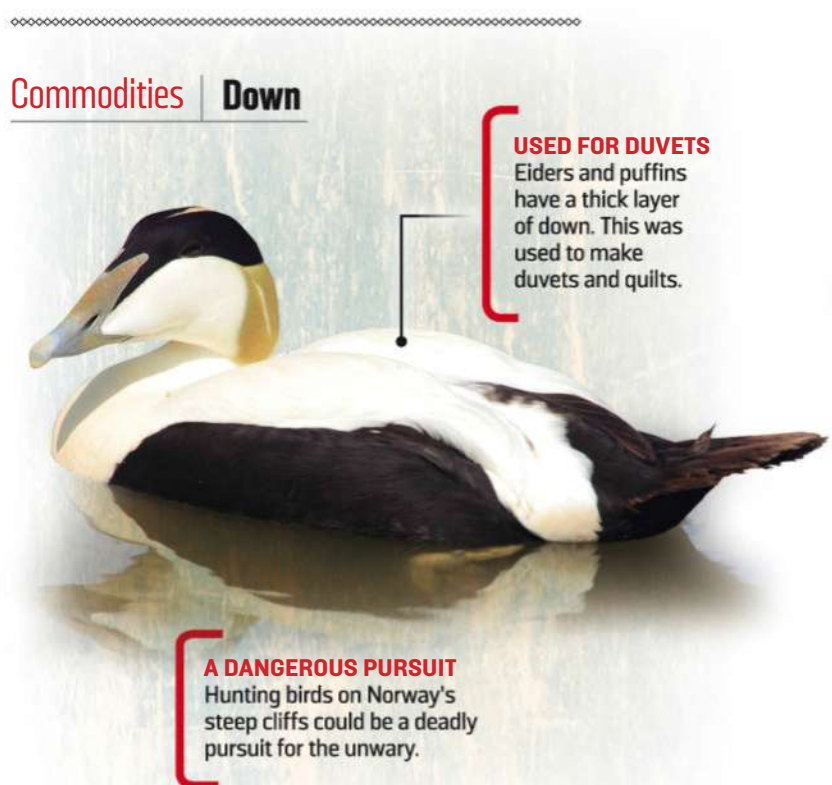
Historians have so far regarded the settlements as a separate chapter in the story of the Vikings' exploits as traders and raiders. If the Greenland Vikings were Europe's major supplier of walrus ivory, however, the story would be different: "We have a tendency to view the Norse in Greenland as an isolated people on the edge of the world, but in fact it has been a society which from the beginning has had close associations with the vibrant life of trading towns around Europe," says Søren Sindbæk.

Vikings relied on experience

Whatever drove the Vikings to Greenland, the task of keeping in touch with Scandinavia, where the Norse brought timber and other goods, was extremely demanding. Sailing was hazardous and the question has to be asked as to how the Vikings managed to cover such long distances in areas that were often characterised by harsh and unsettled weather.

The answer to the mystery is, first and foremost, experience. The Vikings, for example, wrote down travel directions explaining to other seafarers

Continued on page 58



Esben Jessen, experimenter
and captain of *Ottar*.

Esben Jessen has skippered several voyages to places such as Poland and Scotland with *Ottar*, the Viking Ship Museum's reconstruction of a merchant ship from the Viking Age.

How did the Vikings find their way?

The Vikings were skilled navigators and found their way primarily using a combination of senses and years of experience shared through the generations. However, the Norsemen are likely to have had access to a few navigational tools, such as the sun compass and the mythical sunstone.

? The Vikings made their way across huge distances without the use of instruments. How did they do it?

Unlike us, the Norse weren't familiar with using instruments and instead honed their senses and made use of shared knowledge. For example, the Vikings knew that clouds forming over an island took on a particular shape. The movement and appearance of waves told them that land was in sight, too. The Vikings also knew that bird species that depend on land could only fly around 60 to 70 miles from the coast. The Norse could also smell land – for example, the scent of fresh hay being carried far across the sea or, less pleasantly, the smell of a nearby coast where farmers had just fertilised the land with manure.

? How did the Vikings discover new lands?

We must remember that it took generations to populate the North Atlantic. The way they discovered it was that, while sailing, the Vikings saw

something that indicated there was land here – perhaps a particular cloud or birds that didn't live on the open sea. They then packed their ship with provisions and set off to explore the unknown. Then they might settle. A few generations later, their descendants might discover new land and repeat the process.

? Some sources say that the Vikings could navigate in cloudy weather using a sunstone. Has such an instrument been found?

Archaeologists have never found a sunstone from the Viking Age, but it is well described in contemporary sources. For example, the *Saga of King Olaf the Holy* tells how Olaf and the chieftain Sigurd Syr (Harald Hardrada's father) navigated through snowy weather with the aid of a shining sunstone. Most sources were written by people who couldn't sail and navigate. The authors therefore described the sunstone as almost magical, but in reality, it was a simple, practical aid.

The Vikings could read the movement and appearance of the waves. This allowed them to determine if there was land nearby.

? How did the sunstone work in practice?

The stone is a crystal that absorbs the Sun's rays. By holding the stone in the direction of the Sun and rotating it until the light is most intense, it is possible to determine the position of the Sun. The

strongest light is produced when the stone is held perpendicular to the Sun. The stone can thus be used to show the way in cloudy weather or, for example, in the North Atlantic, where the night is so bright in summer that it's impossible to see the stars. Instead of steering by the stars, the Vikings could then point the sunstone at the orange stripe that the Sun forms on the horizon at night to use it to determine their position.

In order to use the stone, the Vikings knew that the Sun would be in the south every day at noon and that it makes a full 24-hour round trip to return to the same place the next day. With that knowledge and a trained intuitive understanding of what time it was, they could use the Sun as a landmark.

Which stone did the Vikings use?

Probably Icelandic feldspar or cordierite. From Guðmundar's saga, we hear about a robber who finds a sunstone among his plunder, but throws it away because he thinks it's just an ordinary stone. The description suggests that it was cordierite.

Archaeologists have found what many scientists believe is a solar compass. How did it work?

Archaeologists in Greenland have found a wooden disc with a hole in the middle, where they speculate that there may have been a spike. If this is correct, the disc was probably a kind of compass for the Vikings to steer by. The instrument worked in principle like the sundials many people have in their gardens. The Viking recorded the position of the sun in the sky by making a notch in the wooden disc throughout the day at the point where the shadow of the point fell.

At the end of the day, the scores would outline a curve. Where the curve was closest to the tip, the shadow had been at its shortest. This would have appeared when the sun was highest in the sky, so the Viking knew that the notch was pointing south. Over the following days, the Vikings could rotate the dial so that the shadow from the tip touched the compass. In this way, they could determine where the four corners of the world were.



The sunstone could reveal the position of the sun even under cloudy skies.

Could the compass be reused time and again?

Only for a few weeks. The curve only remained usable at the same latitudes and at the same time of year as it was drawn. After that, the Vikings had to make a new one.

The solar compass worked for only a few weeks. Then a new one had to be made.

How good were the Vikings at navigating?

The best way to judge this is to read the sources. Accidents and navigational difficulties are presented as special cases, while normal navigation is not mentioned – in the same way as the media nowadays report air crashes but do not tell us every time a plane lands safely at the

airport. We can therefore assume that the Vikings were reliable navigators.

Where does our knowledge of Viking navigation methods come from?

The sagas and archaeological finds provide a lot of information. In addition, we can use practical experiments to deduce what the Vikings might have done. The latter is thus not definitive knowledge, but conclusions drawn from experiments. For example, seafarers and museum staff have gained experience by experimenting with sailing without instruments. In this way, sailors have been able to establish, for example, a rule of thumb that makes it easy to determine the position of the Sun in the sky.

how to get from Norway to Iceland and Greenland. The following was written in the fourteenth century as part of the *Hauksbok Icelandic Saga*:

“From Hernam [present-day Hennø near Bergen] in Norway, head due west towards Hvarf in Greenland, and you will have sailed north of Hjaltland [the Shetland Islands], so that you just glimpse it in clear weather, but south of the Faroe Islands, so that the sea [the horizon] is right in between the distant mountains, and thus also south of Iceland.”

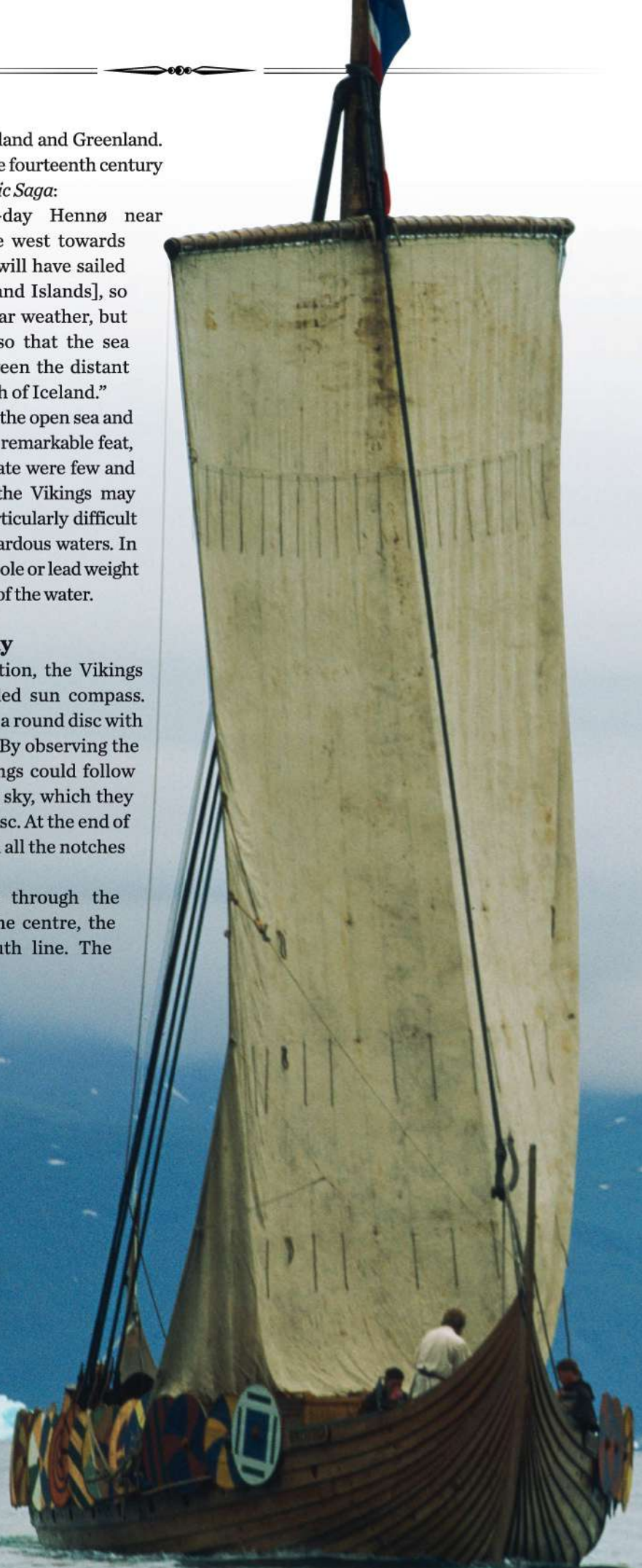
Travelling great distances on the open sea and along treacherous coasts was a remarkable feat, however, for the tools to navigate were few and primitive. Evidence suggests the Vikings may have created some maps of particularly difficult coastlines to help navigate hazardous waters. In addition, they probably used a pole or lead weight on string to measure the depth of the water.

The sun showed the way

To determine the ship's position, the Vikings may also have used a so-called sun compass. This was a simple instrument, a round disc with a wooden cone in the middle. By observing the shadow of the cone, the Vikings could follow the path of the sun across the sky, which they marked with notches on the disc. At the end of the day, the Vikings connected all the notches in a smooth arc.

By drawing the diameter through the point on the curve nearest the centre, the Vikings found the north-south line. The

Vikings would have been aware of wind, weather and sea currents, so planned expeditions according to the season and conditions.



disc could then be used as a compass. However, the instrument only worked for about a week because the sun's position in the sky changed. The sun compass also required the sun to be up. How Vikings navigated in cloudy weather, we do not know. From the sagas we have accounts of a "sunstone" that could determine the direction of the Sun even in dense cloud cover, but archaeologists have yet to find this enigmatic stone.

But above all, the Vikings relied on their observational skills, experience and common sense when they were at sea. By day, they watched the Sun, and by night, the stars showed the way. In particular, the Vikings looked to the North Star, which they called the *Leidarstjarna* (Guiding Star). The star lies close to the North Pole and its brightness made it easy to find.

In addition, the Norse kept an eye out for familiar landmarks, such as burial mounds, tall trees and islands with specific shapes. Often the Vikings named places based on what they looked like, to help them remember the place and its location – for example, the island of *Hjelm* (Helmet) in *Kattegat* (Cat's Gate, a reference to the narrow strait between Denmark and Sweden). If nature did not offer up distinctive landmarks, the Vikings made them for themselves – large stone structures called *vorders* that were visible from the water. In uncharted or unfamiliar waters, Norsemen often turned to locals to show them the way.

In addition, sailors relied on observing their immediate surroundings, and all senses were



Hvalsey Church in Greenland dates from the fourteenth century. The Flateyjarbók manuscript, written in Iceland around 1390, says that the church was built as the 11th of 12 churches in the eastern part of the island.

used as the ship steadily ploughed through the waves. The colour of the water was carefully observed, because it revealed differences in depth and could also warn of reefs and skerries. Plants floating in the water told that the ship was approaching the coast.

In the sky, cloud formations and colour changes showed shifts in the weather, as did ►



Greenland is full of clues

The adventures of the Vikings in Greenland are known to historians not only from the chronicles. Over the years, archaeologists have unearthed a large number of finds that bear witness to the time when the Norse had colonies and small settlements on the island in the Arctic north.

Cranium

This skull was found in the Greenland cemetery where Erik the Red was buried. Researchers believe the skull may be the remains of the Norwegian Viking or a close family member.



Narwhal tusk

Narwhal tusks – like walrus tusks – were sought after in Europe, where they were sold as unicorn horns. The Norse hunted narwhals in the waters around Greenland.

Ruins

North-east of Qaqortoq (formerly Julianehåb), settlers built a church where they gathered for services and prayer. The remains of the church still stand after nearly a millennium.

The church was solidly built from carefully chosen heavy stones and has withstood centuries of exposure to the elements.



small changes in wind direction or humidity. Animal life – birds and sea creatures – could determine if the ship was close to land, and perhaps what landscape was hiding behind the coast.

The Vikings acquired a great deal of knowledge about birds and sea creatures, knowing, for example, where certain sea life foraged, plus which bird species flew out over the open sea, and which stayed close to land. The water could be smelled and tasted for saltiness, and the wafting scents of freshly mown hay, woods or smoke from fires told that there was land nearby.

Did the Vikings reach America?

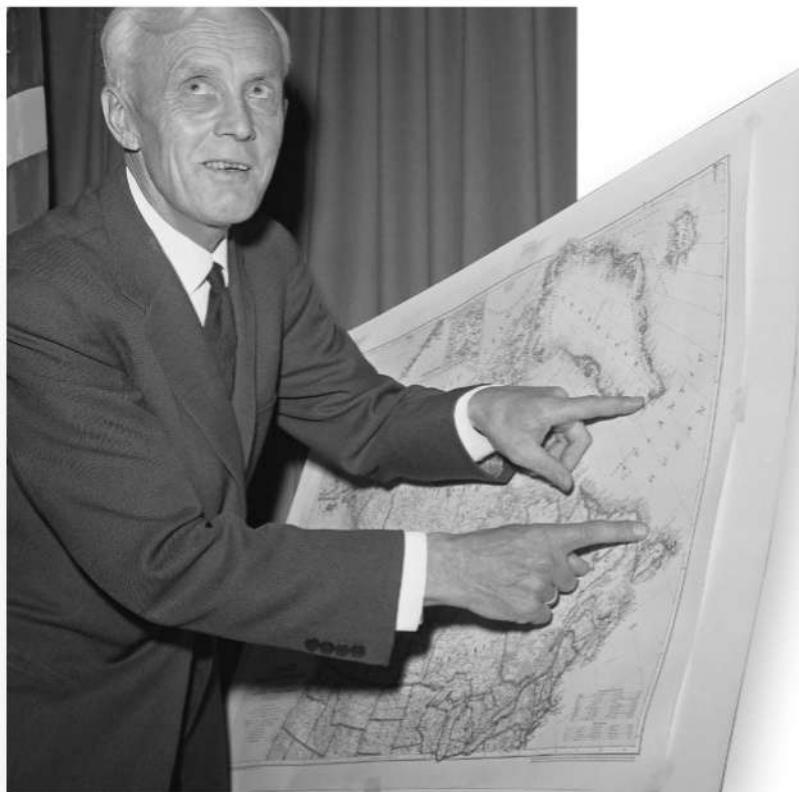
The voyage back to Scandinavia was a long one, and the Vikings feared the turbulent Denmark Strait between Greenland and Iceland. When the Norse heard of new lands somewhere to the west, a group led by the Icelandic Viking Leif Erikson (also known as Leif the Lucky) set out to discover it. That's according to the sagas, which also told of wild grapes growing on the land, which inspired the Vikings to name the area Vinland.

The land was America, and the sagas' account of the Norse discovery was confirmed in 1960 when archaeologist husband and wife team Helge and Anne Stine Ingstad found traces of large halls and peat huts built by Vikings at the settlement of L'Anse-aux-Meadows on Newfoundland's southernmost tip. Canadian archaeologists later found iron nails and parts of a destroyed Viking ship.

The evidence suggests that the settlement had room for around 200 people. The site also housed a complete shipyard with both a timber workshop and a forge, so that the Vikings' ships could be repaired after their long journeys across the sea. The large halls provided crews with winter shelter if the ships were not seaworthy in time. L'Anse-aux-Meadows was built around the year 1000, but was probably only in use for 25 years.

For a long time, historians believed the Viking stay in America was a short one, inspired by the many accounts in the sagas of clashes with the local population, whom the Vikings dubbed Skrælings (a reference to the dried pelts worn by the natives), as well as the harsh climate that accompanied what scientists call the "Little Ice Age" that lasted between the fourteenth and nineteenth centuries.

However, in recent years researchers have found evidence that the Vikings also settled



In the 1960s, Norwegian explorer Helge Ingstad proved that the Vikings really had sailed from south west Greenland to Newfoundland. Among his important finds was a bronze fastening pin in typical Viking style.


” The site also housed a shipyard with both a timber workshop and a forge, so that Viking ships could be repaired after the journey across the sea.

elsewhere in the Americas, and that the Norse stayed on the continent for longer than previously thought. For example, researchers at Baffin Bay in Canada have found a piece of cord that they can now say had been woven in a Viking settlement in Greenland. The cord shows that Vikings visited the area. Archaeologists have also dated a piece of wood from a Viking ship found on Ellesmere Island in northern Canada to around 1250.

At four sites along a 1,600-kilometre stretch of coastline running from Baffin Bay to Labrador, historians have uncovered evidence that the Vikings traded here. For example, archaeologists discovered tally sticks, carved pieces of wood used by traders to keep records. In 2016, archaeologist Sarah Parcak made a discovery at Point Rosee, a windswept promontory on Newfoundland's west coast, that initially appeared to challenge the belief that the Vikings' presence in the Americas was severely limited. Parcak and her team used advanced satellite technology to scan Newfoundland's west coast for traces of Vikings.

The images showed dark patches deep in the ground, prompting researchers to carry out ➤

Commodities | Wadmal



PRECIOUS WOOL
Icelandic sheep supplied the strong, felted woollen fabric.

WORTH ITS WEIGHT IN GOLD
Wadmal became a unit of measurement, like silver and gold.

a test excavation on the promontory. During the excavations, the archaeologists believed they'd uncovered a wall of grass turf, a building method used by neither the indigenous Americans nor the Europeans who migrated to the area in the 1600s. Also near the wall were small lumps of bog ore, a material containing iron that Scandinavian Vikings melted down to make tools and weapons. However, a larger excavation a year later cast doubt on the claims, suggesting it had collected through natural processes.

What happened to the Vikings in America is unclear, but genetically the Norse have survived. When the European settlers came to North America a few hundred years later, many Indians died of tuberculosis, which the Europeans brought with them. The disease was also dangerous for Europeans, but they had developed some immunity and did not die in such large numbers. Surprisingly, the Narragansett people proved as resistant as the Europeans. Scientific analysis has since revealed that the tribe, which lives in the north-eastern US, carries European genes.

The many new finds not only mean new knowledge about the Vikings' expeditions to distant lands; they also underline how much we still don't know about the Vikings' travels. The Norse

may have travelled to regions we can't begin to guess. For example, historians cannot deny that the Vikings may have travelled down the west coast of Africa, perhaps around the time they sailed through the Strait of Gibraltar. New archaeological finds or other discoveries may surprise us in the future and reveal even more secrets about the Vikings' journey into the wider world.

The Vikings founded Russia

Back in Russia, the first place the Vikings reached, their colonisation marked the beginning of what would develop into a mighty Viking empire in the east. According to the sagas, the area's Slavic population gave power to a Viking named Rurik.

Rurik first settled in the town of Ladoga, which he fortified with a wall of stone and clay three metres high and wide. It was to keep rival Vikings out while he, along with local chiefs, established himself within the town. On the banks of the river, Ladoga was rebuilt as a port along Scandinavian lines, and the town included a large dwelling where well-to-do traders could spend the night.

At some point, Rurik relocated south to settle in the Slavic town of Gorodische, which lay on the upper reaches of the Volkhov River. The river linked the Baltic trading route to Lake Ilmen, from where the river originated. The lake was fed by numerous rivers, and it was here two more shipping routes converged, two of the most important trade routes of the Viking and Medieval

ages. One led up the Volga River to Sarkland, the name the Vikings gave to the Islamic East, while the other led south to Byzantium, which the Vikings called Grikland.

This location couldn't have been more central, and finds of jewelled pendants with rune inscriptions, suit pins with dragon heads and arm rings with Thor's hammer

confirm the presence of the Vikings. We know that even the wealthiest Slavs settled this area. They built houses and farms on the hills a few kilometres north of Gorodische, which eventually grew to become the city of Novgorod. The Vikings named the town Holmgård because in spring, when the water in the river rose, it looked as if it were on a *holm* (island). Gradually, Novgorod took over the role of Gorodische and became the destination of choice for Scandinavians travelling to the east. Today, a large statue in the centre of Novgorod bears witness to the time when the Vikings set out for unknown worlds and created a great empire. Not just in Russia, but in every corner of the world. ■

” Archaeological finds or other discoveries may surprise us in the future and reveal more secrets about the Vikings' journey into the wider world.



WE KNOW FOR SURE

Boats and tools were crucial

- Viking ships were **stable and seaworthy enough** to cross the Atlantic safely in harsh conditions in the far north.
- **Navigational equipment finds** such as the sun compass demonstrate that the Norse had simple but effective means of navigating the high seas.
- The Vikings used both **maps and written directions**.
- The Vikings **brought carpenters** to repair the ship en route.

4

different types of ships were used by Vikings to explore the world.



WE STILL NEED ANSWERS

How far did the Vikings go?

1 It was not until the discovery of the settlement of L'Anse-aux-Meadows in 1960 that archaeologists found evidence of a Viking presence in America. There may be even more evidence of the Vikings in

distant places where scientists have not yet looked, such as the coasts of Africa. In addition to reaching America, some historians suggest that the Vikings **sailed down the west coast of Africa after raids in Morocco**.

Why did the Norse leave Greenland?

2 During the fifteenth century, the Vikings left Greenland. The last reliable record on the island dates back to 1408, when a church book records that Thorstein Olavsson and Sigrid Bjørnsdatter were married in Hvalsey Church. Did the Norse choose to leave **because climate change made Greenland cold and inhospitable**? Was it no longer worth staying when the market price of walrus ivory fell? Or was the exodus due to something else entirely?

How long did the Vikings remain in America?

3 Until recently, historians believed that the Vikings only stayed in America for a few decades in the early eleventh century. However, new discoveries might suggest that the Norse stayed on the continent much longer. Some archaeologists believe that Vikings were **still present in America in the thirteenth century**. Both the length and the extent of the Norse presence in America remain a mystery.

It's not clear whether the Vikings tried to live peacefully alongside the native population, or whether conflict was the norm.





*Boys began training for
life as Viking warriors
from the age of five.*

SECRETS OF THE BATTLEFIELD

For over 200 years, the Vikings spread terror among their neighbours, who watched powerlessly as the brutal Norsemen raided villages and monasteries. **Behind the Vikings' victories lay years of combat training, sly warcraft and a willingness to sacrifice their lives to meet Odin in Valhalla.**

In 860, in the streets of the northern Italian city of Luna, a chorus of tall, weeping and wailing Viking warriors followed a bier towards a monastery. The warriors had been carefully selected. Outside the city gates, the rest of their army waited. The war band had tried in vain to take Luna by force, and now its commander was dead. Under the shroud lay their chieftain Hastein. Around his body, his faithful men had placed decorative axes and ceremonial swords studded with gold and jewels.

The day before, Hastein had been baptised into the Christian faith. Luna's Catholic prelate had chosen to grant the terminally ill Viking his dying wish. The mighty Norse chieftain would be laid to rest in a lavish service at Luna's monastery.

According to Norman historian Dudo of Saint-Quentin's account, the church was packed as a choir of monks sang Hastein to the afterlife. But then, just before the body was lowered into the grave, Hastein leapt from his bier, "snatched his flashing sword from its sheath", and killed the bishop who was standing beside the grave with a Bible in his hand. It was the signal for Hastein's men to draw their weapons.

"The pagans," Dudo continued, "blocked the doors of the sanctuary, so that no one could slip away." Then the frenzied killing started. "The

pagans butchered the defenceless Christians ... All upon whom the enemy's fury hit were delivered to the slaughter," Dudo wrote. "They vented their rage within the enclosures of the shrine as do wolves within the pens of sheep." For those trapped in the church, "the last day of life befell them all".

Soon after, the city gates were opened, and hundreds of Vikings streamed in behind the high city walls of **Luna**. By employing cunning, the Viking chieftain had achieved what had proved impossible with a direct assault: he had taken the heavily fortified city of Luna and won wealth for both himself and his loyal retinue, a force numbering up to 2,200 men with 60 ships.

The story of Hastein's cunning assault on Luna in 860 was written 150 years after it happened and probably exaggerates the events.

But sources show that Viking chiefs such as Hastein and his companion Bjorn Ironside had no scruples about using sly tricks to secure their ends and often outsmarted opponents rather than relying solely on brute force.

Vikings raided for 250 years

The Vikings made life hazardous for people situated along Europe's coasts and riverbanks from around 790 to 1050. Their successful raids were based on years of hard training, effective intelligence gathering and tactical acumen. Even the bare-

LUNA

is a port city in northern Italy near the border with France. It was of great economic importance until it was plundered and destroyed by invading forces, including a Viking army.

” They vented their rage within ... the shrine as do wolves within the pens of sheep.

chested berserkers – who, according to the sagas, “rushed forwards without armour, were mad as dogs or wolves [and] bit their shields” – were a calculated part of Viking tactics. The berserkers formed the vanguard and were meant to intimidate the enemy. This tactic proved so effective that for years the Vikings’ enemies dared not oppose their foes from the north.

Boys learned to fight as five-year-olds

We know from various chronicles, sagas and archaeological finds that the Vikings began training for combat as children. The warrior mentality permeated their society, and in the middle of every Viking village there was a square where adults and children as young as five competed daily, either by fighting or in other physical sports.

The activities helped condition the boys’ bodies for the challenges of adulthood, while the men participated for fun and to keep fit. The Vikings had a tradition of such competitions and failing to take part was seen as shameful. In the *Kjalnesinga* saga, a mother even berates her son for lazing around the

fire while “all the young men go there to play” in the tournament. “It would be better for you to be dead than to bring such shame on your family,” she adds.

In general, most of our knowledge about Viking warrior culture comes from their sagas, which aren’t always reliable, but academics consider the descriptions of how the Vikings trained for battle to be credible for the most part.

The sagas reveal that combat training was led by experienced warriors who taught the children techniques for attack and defence. Among other things, the boys had to learn how to use different weapons with both their right and left hands, so they could easily switch if their arm was wounded during combat.

At regular intervals, Vikings from different regions met and fought in great sporting tournaments. The competitions were tough, but they were governed by a set of rules to ensure that no one was seriously hurt. The Vikings valued their *helgi* – physical sanctity. If a man deliberately tried to injure another during the tournament, he was expelled, and his actions declared dishonourable. A warrior might be encouraged to go berserk during real combat, but he had to control his temper during friendly engagements.

Equipment | Helmet



NO HORNS
Viking helmets were used in battle and were never decorated with horns.

PROTECTION The simple, smooth iron helmet covered the top of the head and the bridge of the nose.

Sword was in a class of its own

The boys’ education ended when they reached the age of 12. According to skaldic verses and sagas, by then society expected young male Vikings to have mastered a wide range of skills: close combat with sword, shield and axe, archery, spear throwing, wrestling, horse riding and swimming, as well as long and high jump.

On raids, however, a Viking had to be able to do more than fight. Each man had specific tasks, and the Vikings – of course – had to be able to find food and maintain their weapons. A successful Viking man could therefore also hunt, forge swords and arrowheads, and repair chainmail and shields.

Metalworking was highly valued, and blacksmiths were among the most respected men in Viking society. With fire and iron – and divine help, many believed – he wrought the weapons that warriors used on their raids. Swords were particularly sought after, and the techniques the Vikings mastered were ahead of their time in some ways. Ulfberht swords, for example, were forged from steel that was far stronger than that used for other swords of the age. Their manufacture is still a mystery.

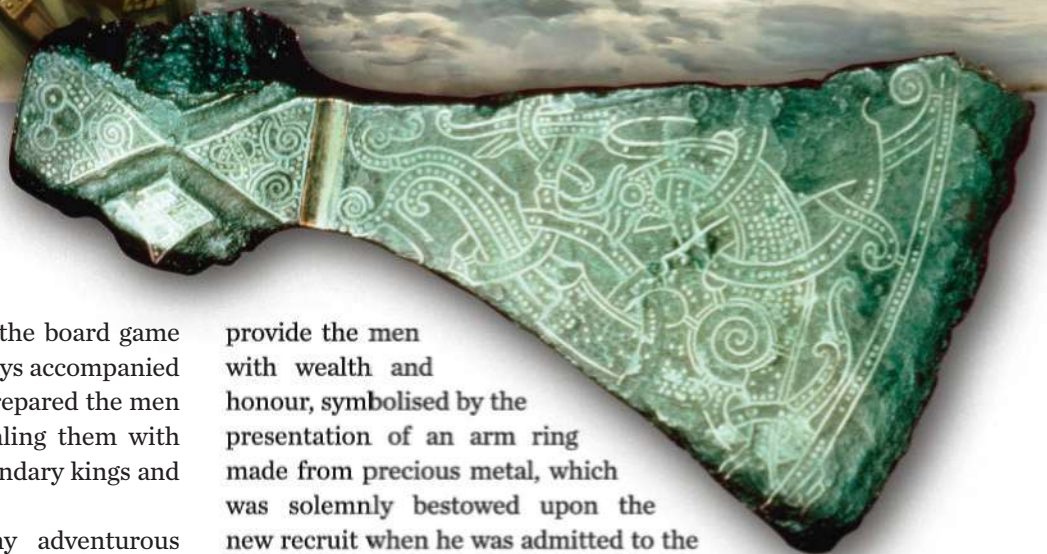
Rune carving and harp playing

Vikings valued a sharp mind, too. They admired men who could carve runes, write poetry, play



The Vikings were more tactical than this painting suggests. They rarely attacked in a headlong charge and used well-drilled formations for both defence and attack.

The axe was the Vikings' preferred weapon for combat. The shaft was long and could be swung with great force.



the harp, and who had mastered the board game hnefatafl. Bards, for example, always accompanied Vikings on their journeys. They prepared the men psychologically for battle by regaling them with poems and songs about brave legendary kings and their faithful men.

The greatest ambition of any adventurous young Viking was to join the chieftain's *hird* – the core of the Vikings' fighting unit. The *hird* was akin to an extended family and could range in size from a single ship's crew to several thousand men, all of whom had sworn eternal allegiance to their warlord. In return, their chieftain promised to

provide the men with wealth and honour, symbolised by the presentation of an arm ring made from precious metal, which was solemnly bestowed upon the new recruit when he was admitted to the powerful brotherhood.

The sworn bond to the chieftain ensured unrivalled discipline in battle, but it was also the Vikings' Achilles' heel. During battles, the chieftain had to be surrounded by the *hird*'s best warriors, because the brotherhood disintegrated, with ►

Equipment | Sword

TYPE The Vikings often used a Carolingian sword of Frankish origin.



THE BLADE was between 70 and 90 cm long, and the sword weighed about one kilogram.

THE HILT was often made of wood. Only a few well-preserved examples now survive.

many warriors surrendering or fleeing, if their warlord died.

On the other hand, the brotherhood of the *hird* guaranteed mutual trust among the fighters as long as the chief lived, because they knew they could rely on one another utterly in battle.

Warriors captured all

The first raids in the late eighth century were probably carried out by small groups of mercenaries who set out to attack targets along the coasts of northern Europe without considering tactics. But the Vikings soon developed a pattern for their raids, in which well-conceived lightning attacks from the sea were crucial. The Vikings selected targets based on observations made during previous raids or by gathering intelligence from travelling traders.

The element of surprise meant everything, and an attack almost always began early in the morning. As the ships approached the target, the warriors lowered their sail and rowed for shore. The ships' low hulls made them almost invisible from land, and with their flat bottoms, the Vikings could row right

up to the water's edge before jumping down into the shallows like modern landing troops. If necessary, the ships could row into estuaries where the water was less than a metre deep. Once they arrived at their destination, the warriors stormed into the village or monastery, shouting and screaming, shiny weapons swinging over their heads. The aim was to terrify the enemy, and numerous sources testify that the tactic worked extremely well. A fearful monk closeted at a monastery in the north of France wrote in the *Annals of Saint-Bertin* of a Viking fleet that attacked the trading post of Quentovic in a "surprise attack at dawn" in 842. The Vikings "plundered it and laid it waste, capturing or massacring the inhabitants of both sexes. They left nothing in it except for those buildings that they were paid to spare."

Raiders split when under attack

Extortion was a common tactic. While the main force of warriors made a frontal assault on a town or monastery, the rest encircled it so that no one could escape. The Vikings quickly identified

Continued on page 74

Viking weapons were loaded with symbolic power



SWORD

In Old Norse, the word *sverð* means penis. The Vikings believed that sword amulets could enhance men's virility and battle skills.

A sword was expensive and was therefore less common than the axe.



SPEAR

According to one legend, the leader of the gods, Odin, began the world's first battle with a spear throw. Therefore, the spear was a noble weapon that was also used by kings. The Vikings were also armed with other ranged weapons, such as bows and arrows.



AXE

Axe-shaped amulets promoted health, vitality and strength, and were associated with the god of the common man, Thor. The axe was the most popular weapon in the early Viking Age but was difficult to wield in close formations.



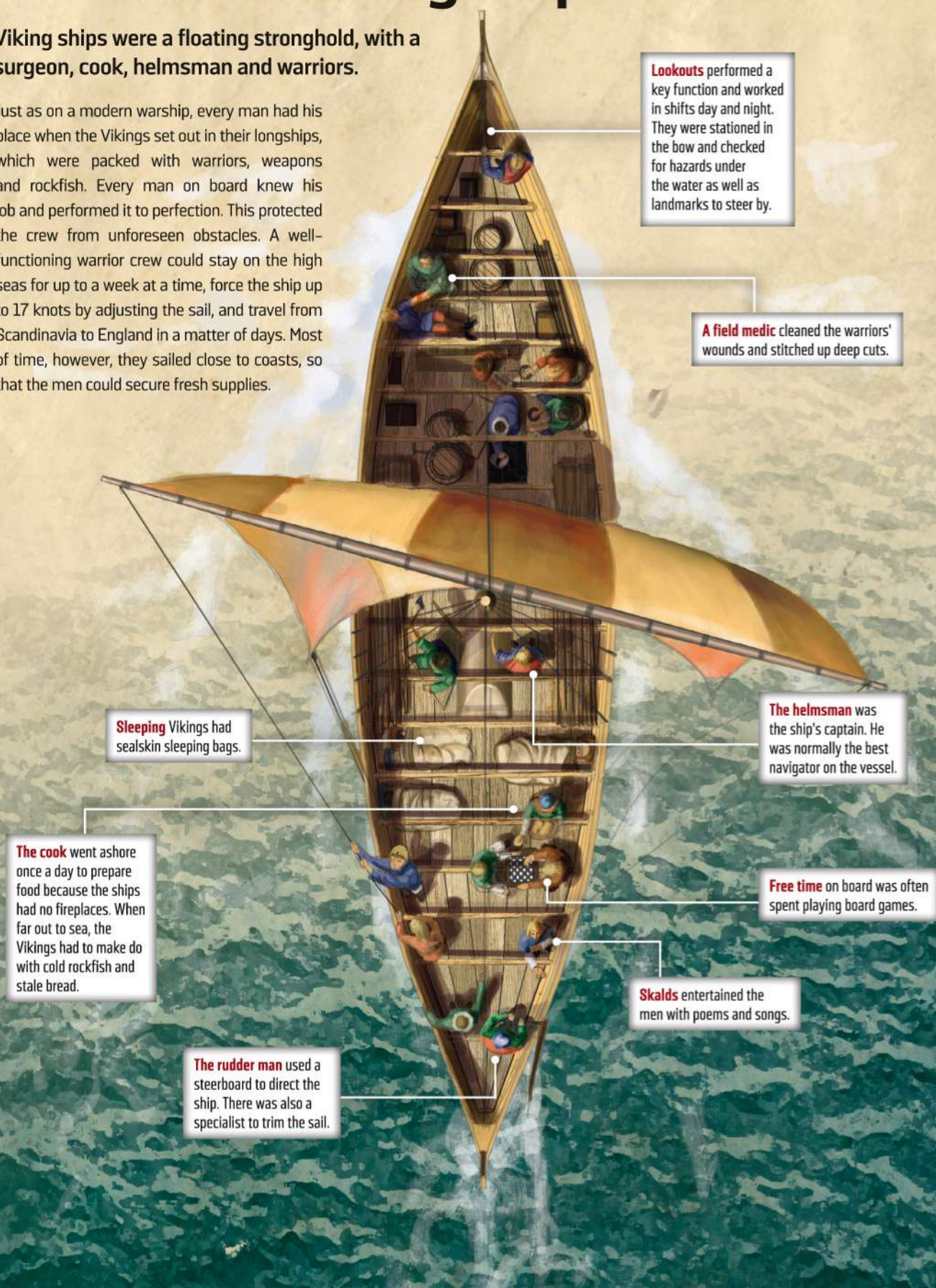
SHIELD

The Vikings associated the shield with the fertility goddess Freya. They viewed the shield as a feminine force that helped look after the warrior – much as a mother protects her child.

Everyone had a role on board a Viking ship

Viking ships were a floating stronghold, with a surgeon, cook, helmsman and warriors.

Just as on a modern warship, every man had his place when the Vikings set out in their longships, which were packed with warriors, weapons and rockfish. Every man on board knew his job and performed it to perfection. This protected the crew from unforeseen obstacles. A well-functioning warrior crew could stay on the high seas for up to a week at a time, force the ship up to 17 knots by adjusting the sail, and travel from Scandinavia to England in a matter of days. Most of time, however, they sailed close to coasts, so that the men could secure fresh supplies.



Lookouts performed a key function and worked in shifts day and night. They were stationed in the bow and checked for hazards under the water as well as landmarks to steer by.

A field medic cleaned the warriors' wounds and stitched up deep cuts.

Sleeping Vikings had sealskin sleeping bags.

The cook went ashore once a day to prepare food because the ships had no fireplaces. When far out to sea, the Vikings had to make do with cold rockfish and stale bread.

The helmsman was the ship's captain. He was normally the best navigator on the vessel.

Free time on board was often spent playing board games.

Skalds entertained the men with poems and songs.

The rudder man used a steerboard to direct the ship. There was also a specialist to trim the sail.



Why did the Vikings go berserk?

Sagas and contemporary sources talk about the berserkers – fearsome Viking warriors who frothed at the mouth and fell upon their foes in a bloodthirsty rage. Seemingly immune to pain or fear, they attacked with one goal in mind: to kill as many of their enemies as possible. If the stories of the berserkers are true, researchers speculate that the warriors were either drugged or insane.

THEORY 1: Mushrooms

Mushrooms used as an hallucinogen

Red fly agaric fungi cause hallucinogenic effects when consumed and have therefore been posited as a possible trigger for the Vikings going berserk. The theory was first advanced by Swedish theologian Samuel Ödmann in 1784. Ödmann based his idea on accounts of Siberian shamans who used red fly agaric mushrooms to promote out-of-body experiences and visions. Since then, researchers have

tried to prove the theory by observing the fungi's effect on the mind and body. They have learned that red fly agaric contains a number of neurotoxins and hallucinogens, including bufotenin, which can cause psychosis. The primary psychoactive substance, however, is muscimol, which affects the central nervous system to produce feelings of euphoria, lightness and visual and colour disturbances.

FOR AND AGAINST:

✓ Red fly agaric has reportedly been used as an intoxicant in Asian cultures for over 7,000 years.

✓ In lab experiments, fly agaric's toxins have made rats indifferent to threats and dangers.

✗ The consumption of mushrooms is not mentioned in contemporary sources. The theory first emerged 700 years after the Viking Age.

✗ The effects are varied, ranging from relaxation and joy to dizziness and apathy.

Acid makes the fungus red

1 The top of the mushroom contains ibotenic acid, which gives the fungus its red colour. However, the hallucinogenic effect comes from a substance called muscimol.



Red fly agaric, unlike the white and green varieties, is only lethal in large doses. By boiling the fungi for a long time, the effects can be removed, either completely or partially.

Body's functions are affected

3 When muscimol affects the central nervous system, hearing and vision are affected. For example, objects appear much larger than they really are. This is called *macropsia* or the *Alice in Wonderland syndrome*. The user is in a state of intoxication.



Drying activates substance

2 When the mushrooms are dried, a chemical reaction produces the hallucinogenic substance muscimol. The substance is a psychoactive chemical compound that binds to receptors and inhibits the associated nerve cells.



Only dried mushrooms have an hallucinogenic effect.

Brain malfunction triggered blind rage

A prevailing scientific explanation for the berserkers' state of mind is that these brutal and fearless warriors were suffering from a mental disorder. Blind Rage Syndrome (BRS), defined in a 1987 study published in *Psychological Reports*, seems to be the closest match to disorders recognised today. BRS, which often occurs in crimes of

passion, is characterised by the perpetrator feeling a sense of superhuman strength while the violence is happening, followed by complete amnesia. This means the aggressor doesn't recall carrying out the attack. The violent overreaction is sometimes triggered by person-specific visual or verbal insults.

FOR AND AGAINST:

✓ Blind Rage Syndrome fits the description of the Vikings' berserker state as detailed in several different sagas.

✓ The disorder is exclusively observed in Caucasian men, like the Vikings.

✗ There's no reason why the disorder should be more common among Scandinavians than among the English, but it seems that only Viking warriors went berserk.

Rage explodes

1 A 2016 scientific study demonstrated that the six centres in the brain's frontal lobe that control emotions are smaller in patients who are prone to violent and sudden rages. Patients lack the ability to contain their emotions, and a single provocation can ignite an uncontrollable outburst of anger.

Memory shuts off

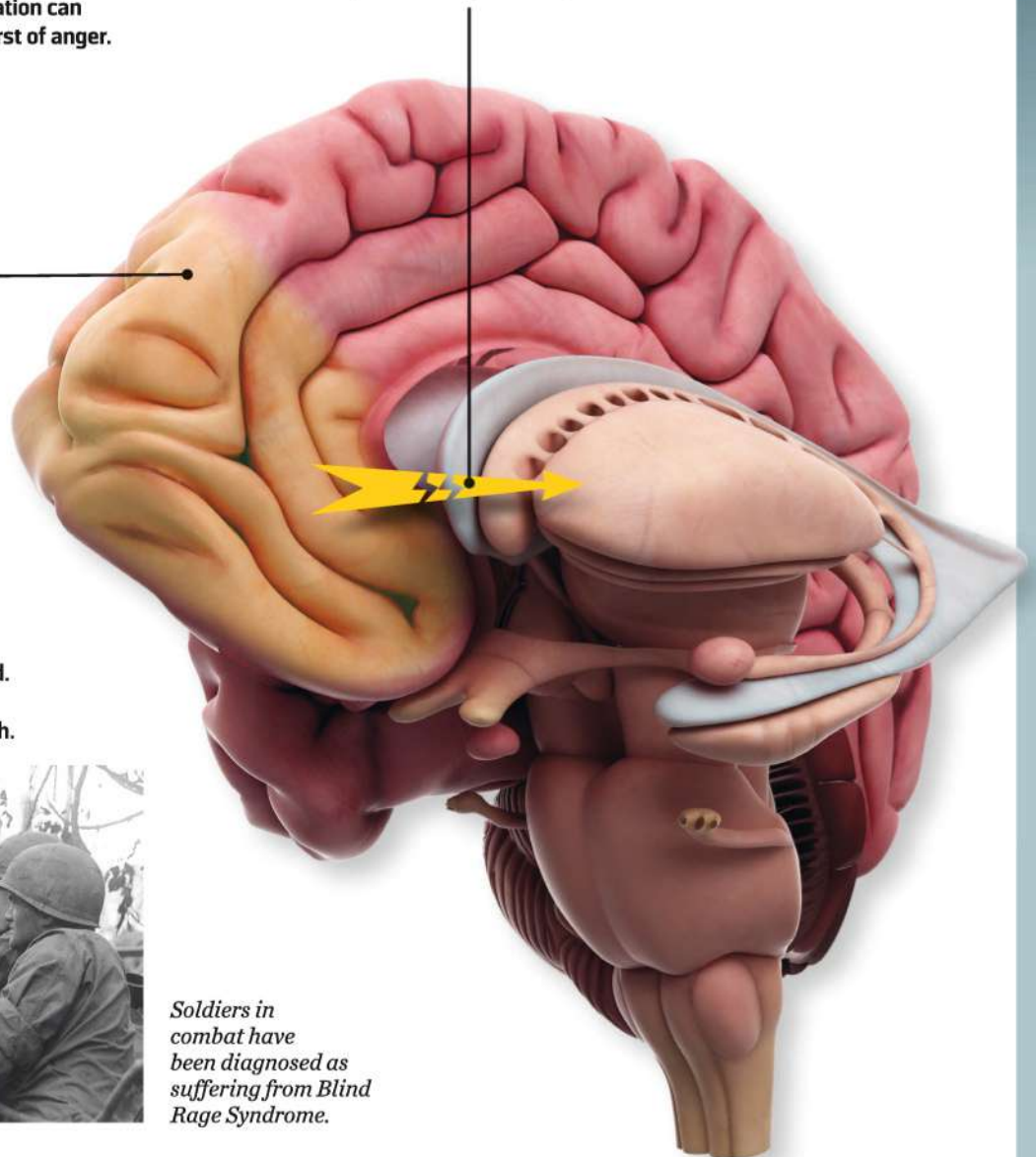
2 Normally, the brain transfers processed impressions from the frontal lobe to the hippocampus, which decides whether or not the memory should be stored. But in patients with Blind Rage Syndrome, the connection is severed and they experience what is popularly termed a blackout. Patients have no subsequent memory of the episode.

Violence continues

3 As a result of the uncontrollable rage and memory blackout, the patient shows no restraint and continues to be violent, even though their enemy is defeated. Some patients experience a feeling of superhuman strength.



Soldiers in combat have been diagnosed as suffering from Blind Rage Syndrome.



THEORY 3: Poisonous plants

SCHOLARS' BEST GUESS

Henbane numbed and gave a sensation of flying

In recent years, henbane, a poisonous weed from the nightshade family, has become historians' favourite explanation for the Vikings' mad behaviour on the battlefield. Unlike euphoric mushrooms, archaeologists have found henbane seeds in Viking graves. The intoxicating effect of henbane was probably also more predictable and desirable

than the effect produced by ingesting fungi such as red fly agaric.

The documented effects of henbane include a numbing sensation, expansion of the lungs and powerful hallucinations. Henbane can be fatally toxic, however, and an overdose of the weed can paralyse the user's breathing.

FOR AND AGAINST:

- ✓ Henbane seeds have been found in a Viking grave at a tenth-century Danish ring fort.
- ✓ The use of henbane as an hallucinogen was documented by Pliny the Younger in Greece around AD 100.
- ✗ Henbane has undesirable side effects, including acting as a mild diuretic.

Henbane is a weed that grows in sandy soils. It grows to 25–80 cm in height.



Seeds are crushed and smeared on thin skin

1 Crushing the plant's seeds releases the toxic alkaloids hyoskyamine and scopolamine, which can be absorbed into the body by applying the ointment to areas where the skin is thin, such as the groin or under the arms. Alkaloids are in all parts of the plant, but the seeds contain the most. The effect can last for three days.



Ointment increases pain threshold

2 The ointment makes the skin numb and has a lasting euphoriant effect. On the battlefield, the ointment provokes a high pain threshold along with the sensation of having supernatural powers. The balm is also called flying ointment, because it gives the user a sense of flying. This effect is believed to have given rise to the myth that witches flew.



THEORY 4: Religious fervour

Rituals triggered hypnotic trance state

Mysterious archaeological finds, including a woman buried with special artefacts, plants and treasures, suggest that witch-like seers brought a spiritual and religious flavour to Viking societies. It is not known what rituals were used by the warriors as part of their culture, but several historians attribute the trance-like ferocity of the berserkers to a

series of rituals that may have been rooted in their faith. Studies have shown how religious rituals can affect both the brain and the body. People in deep trance states lose conscious control of what they are doing and instead act subconsciously. They are detached, feel no pain and have little awareness of their surroundings.

FOR AND AGAINST:

- ✓ Rituals are easy to imitate, so many Vikings could have learned how to go berserk on the battlefield.
- ✓ No sagas refer to the berserkers as mad or intoxicated, but rather as men of a certain character.
- ✗ Historical sources do not record seers or religious rituals in connection with Vikings going berserk.

Howling rage

1 Studies have shown that repeating a monotone sound or cry, such as an animal's roar or howl, activates areas of the brain's frontal lobe linked to strong emotional responses, such as anger.

Biting awakens animal instinct

2 Berserk Vikings bit the edge of their shields, which were covered with either steel or stiffened animal hide. The reason for this bizarre behaviour is disputed, but some theories suggest that the act enabled berserkers to shed their human sides to become more like their totem animals and hence take on their ferocity.

Skins let men shed their fear

3 Berserkers were known to go into battle dressed in animal skins, particularly those of bears or wolves. This reflects the ancient tradition of drawing strength from a totem animal. Anthropologist Bronisław Malinowski suggested that early peoples used totemism to surrender their souls to animals. In so doing, they believed they gained new powers, such as invincibility.



Equipment | Shield



WOOD Viking shields were round and made of wood, with an inner handle usually of leather.

IRON The shield was reinforced with iron. This increased the strength, but also the weight.

those who could be ransomed: priests, rich merchants and lords. The warriors also offered to spare stately buildings – for a hefty fee, of course. The rest they looted and burned. The inhabitants were taken away as slaves.

On the rare occasions when the Vikings were caught by an enemy force before completing their plundering, they split up into small groups and fled in separate directions. This forced the enemy army to either give up the fight or split up and meet the

Vikings in smaller groups. The Scandinavians often proved stronger in such skirmishes because of their years of training. Afterwards, the Vikings would regroup at an agreed location, reboard their boats and sail on to their next objective.

Live hostages were worth more

Over time, the Vikings became bolder and more skilled. Raids lasted longer, ships sailed deeper inland, and they hit better-defended targets. They even attacked heavily fortified cities.

In June 843, two Norwegian chiefs, Åsgeir and Gunnar, rowed 67 ships up the Loire River, through southern Brittany. Their destination was the ancient Roman provincial city of Nantes, which was surrounded by high but decaying city walls. News of the enemy fleet reached the city on 24th June, during the town's Saint John's Day celebrations. Nantes' citizens quickly closed the city's gates, but to no avail; the Vikings scaled the walls with siege ladders and poured into the city. An eyewitness later wrote an account of the attack:

"Seeing their enemies entering the city walls they [the citizens] ran to the church of the apostles St Peter and St Paul and barred the doors against the persecutors, praying for divine deliverance, as they couldn't save themselves."

Moments later, the Vikings burst into the church and stabbed the bishop in the middle of the opening prayer, 'Sursum Corda' ('Lift up your hearts').

According to the eyewitness, "All the other monks, whether they were in the church, outside it, or at the altar were put to the sword and disembowelled." The bloodbath was just getting started, though. The grisly account continued:

"Children hanging on their dead mothers' breasts drank blood rather than milk, the stone flags of the church ran red with the blood of holy men and the holy altar dripped the blood of innocents. The pagans then pillaged all the city, seized all its treasures and set fire to the church. They then took

Warriors began their careers at the age of five

5-10 yrs

Viking boys compete daily in everything from ball games to sword fighting. Board games and harp playing are also pursued. At large tournaments, where adults compete, the boys have their own games.

12 yrs

The boy becomes an apprentice and is considered an adult when the first downy hair appears on his upper lip. By then the boy is expected to be fully trained in the use of shield, sword, axe, spear, bow and arrow.

13-25 yrs

The future warrior swears allegiance to a chieftain and his hird. During a ceremony, the new warrior recites his skills and duties, and receives an arm ring from the chief, along with promises of wealth and honour.



On small ships, one man sat at each oar. On large ships, each oar was manned by two men.

a great number of prisoners as hostages for ransom and returned to their ships.”

This tale and other blood-soaked testimonies are probably exaggerated. Vikings didn’t kill more than was necessary – people were more valuable alive. Most of their victims were taken as slaves and sold in slave markets or kept as labourers by the Vikings.

Vikings were victorious at Maldon

Large Viking armies were happy to challenge royal armies in open battle. In 991, a mighty Viking fleet

sailed from Scandinavia towards England. It was led by the Danish king Sweyn Forkbeard and the Norwegian chieftain Olaf Tryggvason.

Together, the two lords commanded 94 ships and around 4,000 experienced warriors from Viking settlements in Denmark, Norway, the area covered by the present-day Baltic states, Russia and Ukraine.

Greedy for wealth, the Vikings headed for the coastal town of Maldon in Essex, where there was a royal mint that issued silver coins. The ►

25 yrs

By excelling in battle, the warrior can advance to the honorary post of standard-bearer. During battle, the standard is used to signal where the hird's leader is.

30 yrs

After many years of service, a successful warrior can advance to the position of *stallar* – a type of general and the chief's closest advisor. He sits next to the chief at meals and acts as the chieftain's spokesman.

35 yrs

If the warrior is released from his oath bond after faithful service, he can form his own brotherhood. The warrior is well placed to become a chief if he is tall, rich and distinguished in battle.

THE BATTLE OF MALDON is an Old English poem describing the Battle of Maldon in 991, when an Anglo-Saxon army failed to stop a Viking invasion.

Norsemen set up camp on the island of Northey, east of Maldon.

Horried, England's King Æthelred mustered his army under the commander Byrhtnoth and had them line up facing Northey. The water was so shallow that the Vikings waded out to meet them. The **'Battle of Maldon'** poem describes the battle:

"Then the slaughter-wolves waded – caring not for the water ... across the bright waters, carrying their board-shields ... the spears grimly ground down, bows were busy ... Bitter was the onslaught, warriors fell on either side."

The English commander sent his warriors on a charge against the Vikings, but the Norsemen's shield wall held. Then, just as the English attack was petering out, the Vikings ran straight for the English commander Byrhtnoth in a fierce counter-attack.

A young Viking's spear pierced Byrhtnoth's body. Another Viking rushed forward "to carry off the rings of the warrior, the armour and the accoutrements and the ornamented blade".

Desperate, Byrhtnoth tried to fight back, but another Viking came along and slashed his sword

into the grey-haired Englishman's arm, sending the commander's gold-tipped sword crashing to the ground. Mortally wounded, Byrhtnoth urged his soldiers to continue the fight before turning his eyes and prayers towards heaven.

"Then the heathen warriors cut him down," the poem reports.

The Vikings had gone straight for the enemy leader and the tactic had worked. News of Byrhtnoth's death spread quickly through the English ranks and many fled.

“ The slaughter-wolves waded ... the spears grimly ground down, bows were busy ... Bitter was the onslaught, warriors fell on either side. ”

The price of peace

The victory at Maldon cost the Vikings many lives. Open battles were always risky, and the Scandinavians preferred to avoid them if possible. Consequently, the Norse warriors frequently offered to let their opponents pay them not to attack. Extortion of this kind was one of the most

profitable lines of business for the Viking raiders.

In 845, the Frankish king, Charles the Bald, was unable to prevent a Viking force from plundering Paris. When he couldn't find a military solution, Charles paid the Norsemen 7,000 livres of silver (approximately 2,570 kilograms) to leave the city in peace. It was an outrageous sum – a sword, which was seen as a precious item, cost 125 grams of silver in the Viking town of Hedeby at the time. The sum Charles paid was therefore equivalent to 14,500 swords. The Frankish king raised the money by taxing his subjects with a levy that later became known as the danegeld.

Sweyn Forkbeard and Olaf Trygvason were also paid off handsomely. The two commanders demanded 10,000 pounds of silver from the English King Æthelred after the Battle of Maldon. The payment was agreed on the basis that the pair would not attack any more towns. Just two years later, however, the men launched more successful raids, forcing Æthelred to stump up another 16,000 pounds of silver to make them go away.

Despite the lucrative nature of their raids, the Vikings' dominance waned during the eleventh century as the balance of power shifted. England slowly grew stronger, while succession issues in the Vikings' ruling houses, combined with internal power struggles, served to weaken their empire.

The arrival of Christianity also contributed to the Vikings' decline. The tough warrior culture slowly changed to adopt Christian values, and attacks against fellow believers were frowned upon. The Norse were slowly evolving into Europeans. ■

Equipment | Axe



Trained for war

- Viking culture was designed to forge strong warriors. **Training began from the age of five.**
- The shield wall and the wedge served as the Vikings' **most effective tactic** for defence and attack respectively.
- The Viking ship was the innovation behind the Norsemen's success. **The ship was fast and could navigate both shallow rivers and rough seas.**

793

is the year when Viking raids were first documented. We know from these sources that the warriors were fearless and well trained.

? WE NEED ANSWERS

How did the Vikings forge swords?

1 The Viking Ulfberht swords from the eleventh century were made from steel that analysis has revealed came from the region of modern-day Afghanistan and Iran. The steel had a very **high carbon content**,

three times higher than most other swords of the period. The blade was able to withstand hard blows and was flexible enough to **bend without breaking**. Historians still wonder how the Vikings obtained the steel for these swords.

Who were the berserkers?

2 Although the sagas offer several accounts of the berserkers, there is still much doubt about what and who the animal-skin-clad warriors actually were, and whether they fought in a frenzy, as is often portrayed. The 'Hrafnsmál' poem, written by Þorbjörn Hornklofi in the late ninth century, described men **dressed in wolfskins** fighting in a great bloodlust with spears. Similarly, Snorri Sturluson's *Ynglinga saga* tells of **men without armour running mad as wolves and strong as bears, protected by Odin**. The word berserker has its roots in the Old Norse *ber* (bear) and *serkr* (akin to Scottish word *sark*, meaning shirt or shift). If the accounts of the berserkers are true, they were probably fearsome warriors dressed in bearskins, possibly because they believed they could take on the strength and invincibility of a bear, and because the bear was one of the animals that represented Odin.



The Vikings' elite warriors were described in detail in the sagas and monks' accounts.

Odin, the most important god of Norse paganism, was worshipped using small wooden statues. Reverence for Odin was crucial in securing warriors a place in Valhalla.



WHERE DID NORSE MYTHS COME FROM?

Odin came from Germany, Valhalla was invented by the fireside and Hel was borrowed from Christianity. Then a Greek multi-headed dog was thrown into Norse mythology. **The world of Viking gods looks like a mix of other religions, but how Norse paganism emerged remains a mystery.**

Flames lick up the sides of the ship. Crackling, the fire eats into the dry wood and flares up. In less time than it takes to walk ten kilometres, the blaze burns the ship and the dead warrior to ashes. The soul of the deceased begins its journey. Having died in battle, the Viking is assured eternal life in Valhalla, the home of fallen warriors in the realm of the gods. As soon as the body is burned, the Valkyries, Valhalla's female warriors, lift the dead man and fly him over land and rivers to Valhalla. Upon arrival at the mighty hall, several Valkyries welcome him. One of the winged women hands him a drinking horn filled with mead. Ahead of him await sumptuous meals, endless warrior jousts – and unlimited hot footbaths.

This is how Vikings imagined their journey after death – and the mention of the dead warriors' access to footbaths testifies to the level of detail ascribed to the Viking gods' world. The description is from the poem 'Helgakviða Hundingsbana II', which tells of the Viking hero Helge Hundingsbane's journey to Valhalla. The poem, which was probably written in the thirteenth century, is one of many accounts of the Vikings' ideas about their gods and life after

death. Together with other poems and stories, and archaeological finds, the tale forms the pieces of a jigsaw that is helping historians build up a picture of Norse beliefs and the world of their gods.

Stories are 300 years too young

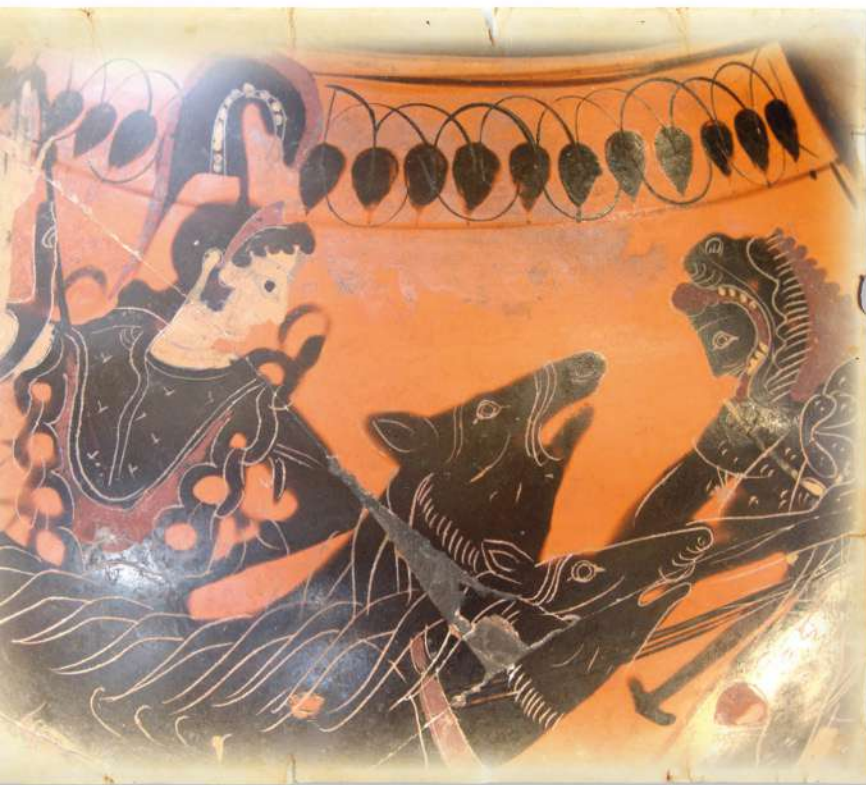
Even today, most people have heard of the Vikings' main gods: the thunder god Thor, the god of victory and death, Odin, and the beautiful fertility goddess Freya. But although we're familiar with their names, we actually know very little about them. In fact, most accounts of the Norse pagan gods and how the Vikings worshipped them were written 200–300 years after the Viking Age ended.

” Most accounts of the Norse pagan gods and how the Vikings worshipped them were written 200–300 years after the Viking Age ended.

The authors based their accounts on stories passed down by word of mouth among the Norse for generations. What's more, the writers were Christians and therefore probably influenced by what they had heard from priests or read in the Bible. Some

of the authors had great difficulty keeping the Bible's accounts out of the Vikings' beliefs, such as the chronicler Snorri Sturluson, who wrote at one point that the Nordic gods' homes were in heaven, while in other accounts he placed the gods' dwelling place in the centre of the Earth.

Some religious scholars even believe that parts of the stories were more or less copied >



The Vikings drew inspiration from Greek mythology. For example, the Greek hellhound, Cerberus, became Garmr, the dog that guards the Viking kingdom of death, Hel.

from the Bible. They maintain that the tales of Norse gods were handed down in monasteries, and Christian beliefs were thus woven into the myths of the Viking Age.

Medieval sources tell us that the Viking gods were in fact ancient kings. The Norse admired these great men so much that they proclaimed them holy, in much the same way as the Catholic Church canonises specially selected men and women. According to medieval accounts, the holy Viking kings had come from the East, prompting a comparison with the story of the three kings of the Nativity.

Most scholars agree that the Norse gods were inspired by narratives from outside the Viking world. But while some believe their origins lie in monasteries, others look to central and western Europe for inspiration. What is certain is that sources from that part of the world tell of gods who are similar to the Norse ones and bear almost identical names.

The ancient Germanic god of war, for example, is called Woden, a name very similar to Odin, his Norse counterpart. Woden is mentioned in ancient Roman sources, and there is no doubt that

the Vikings heard tales of the Germanic god from their southern neighbours.

Norse paganism was a mixture

From the Germanic tribes, the Scandinavians also got the idea of shield-maidens, female warriors who fought alongside men on the battlefield. In time, the shield-maidens became the Valkyries, the winged servants of the war god Odin. The Roman world of gods also found its way to Scandinavia. Thor, for example, has many features in common with Jupiter, the Roman god of the sky and thunder.

It is likely that the Vikings' set of beliefs, which later became known as Asatro, were a mixture of many different ideas and deities, ranging from Indian and Syrian gods of nature to legends from Germanic tribes who lived near the Nordic countries. The ideas arrived with travellers and traders, and over time took on local characteristics.

Historians don't know when the Norse developed their unique beliefs but some scholars believe that Odin, one of the most important Norse gods, was a well-known figure of worship long before the Viking Age. He appears in rock carvings from as early as the Bronze Age, and he may also be depicted on bracteates, a kind of gold medallion worn around the neck by wealthy Iron Age people.

It was not until the eighth and ninth centuries that rune stones and images of gods provided tangible evidence of the arrival of paganism in the Nordic countries. We know that the gods were called Odin and Thor from records made by English chroniclers when the Vikings invaded the

British Isles. Scholars believe that the tales of the gods were kept alive through narratives and depictions, so that over time the sacred figures took on their own distinctive personalities in people's minds. In this way, the Vikings developed a detailed mythology that accurately described how the world was structured. According to the tales, the world consisted of several

kingdoms, arranged in circles around the great sacred tree Yggdrasil. Furthest from Yggdrasil was Utgard. It was there that the giants lived.

Closer towards the centre of the world was Midgard, which was the domain of humans. And beneath the tree was Hel, the realm of the dead. Vikings who died a natural death went there. Originally, sources described Hel as a peaceful and almost pleasant place to rest, but views of the kingdom of the dead changed over time, ►

It was not until the eighth and ninth centuries that rune stones and images of gods provided evidence of Norse paganism.



Scientific tool

Ground-penetrating radar

Radar revealed buried Viking ship

Viking beliefs and deities are reflected in burial finds. But as graves leave few traces above ground, they are difficult to discover. Ground-penetrating radar can 'see' through the layers of soil and is therefore a vital aid to archaeologists.

Graves tell researchers a lot about Viking beliefs and lifestyles. Finding them is difficult, however, and excavations are both time-consuming and labour-intensive. Ground-penetrating radar (GPR) makes the

job easier by enabling researchers to use electromagnetic waves to see through layers of soil and discover large, buried objects. Near the town of Halden in Norway, archaeologists using GPR have found a Viking ship, which

was probably part of a chieftain's burial. Only three intact preserved Viking ships have been found in Norway until now, so the discovery of another will contribute important knowledge about burials and boats.

1 Pulses

The radar sends electromagnetic waves into the ground.



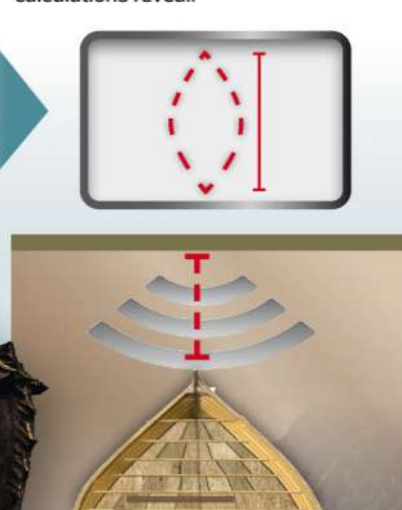
2 Reflection

Hard materials such as wood and stone bounce the waves back, creating an image on what is called a radargram.



3 Outline

The radargram shows the exact shape of a Viking ship. The structure is around 20 metres long and lies about half a metre below ground level, calculations reveal.



Among other things, GPR can send archaeologists on the trail of buried Viking ships.

Equipment | Thor's iron gloves

JÁRNGREIPR is the name of Thor's iron gloves. They are part of a set together with the hammer Mjölir and the belt Megingjörð.



THE GLOVES are needed to control the powerful hammer Mjölir.

probably due to the influence of Christianity's tales of Hell. In the thirteenth-century *Prose Edda* by the bard Snorri Sturluson, Hel resembles the Christian Hell – a dark and unpleasant place where people dreaded ending up. However, Snorri may have drawn inspiration not only from Christianity, but also from Greek mythology.

Like Hel, the Greek land of the dead, Hades was an inhospitable and joyless place in which people feared finishing up. The similarity with Greek

mythology is not limited to the general nature of the netherworld. Details describing the domains in Greek and Norse mythology coincide in several respects. For example, on the way to Hades, the dead had to cross the river Styx. In Norse, the river leading to Hel is called Gjöll. And just as Hades was guarded by the dog Cerberus, the Norse abode of the dead had Garmr, its own guard dog. Garmr had bloody fur and howled piercingly at anyone who approached Hel, recounted 'Baldrs Draumar', a poem from the mid-tenth century.

Warriors lived for ever in Valhalla

Valhalla, the hall of the slain, was different. It first appears in Icelandic poetry from the ninth century, although some scholars believe the concept of the hall dates from around the sixth century. Valhalla may have been inspired by ancient Indo-European ideas of a heavenly kingdom of death.

Others believe that the Norse invented Valhalla as a heavenly realm after they came into contact with Christianity. However, it had little in common with the peaceful Christian heaven. Located in Asgard, the middle realm where the gods lived, it was inhabited by the god of war, Odin, and only warriors who fell in battle could go there. As soon as the warrior died, he was taken – at Odin's command – by the Valkyries, winged warriors who effortlessly flew the Viking over all obstacles and straight to the doors of Valhalla.

Here all sorts of splendour and glory awaited. The gigantic hall had 540 doors that were so large that 800 warriors could march through shoulder to shoulder.

Valhalla offered everything a Viking valued in life: food, fighting and mead in abundance. As often as they could, the warriors feasted on ➤

Important Viking gods



ODIN

is king of the gods. From his throne in Valhalla, he watches over everything and everyone, aided by his wolves and the ravens Huginn and Muninn. Odin has only one eye. He gave the other to the wise man Mimir as payment for being allowed to drink from the well of knowledge.



THOR

is the god of war and fertility. His presence is felt by all as he wields the hammer Mjölir and creates thunder and lightning while riding above the clouds in his goat-drawn chariot. Thor is steadfast and reliable. His job is to keep law and order in the Viking world.



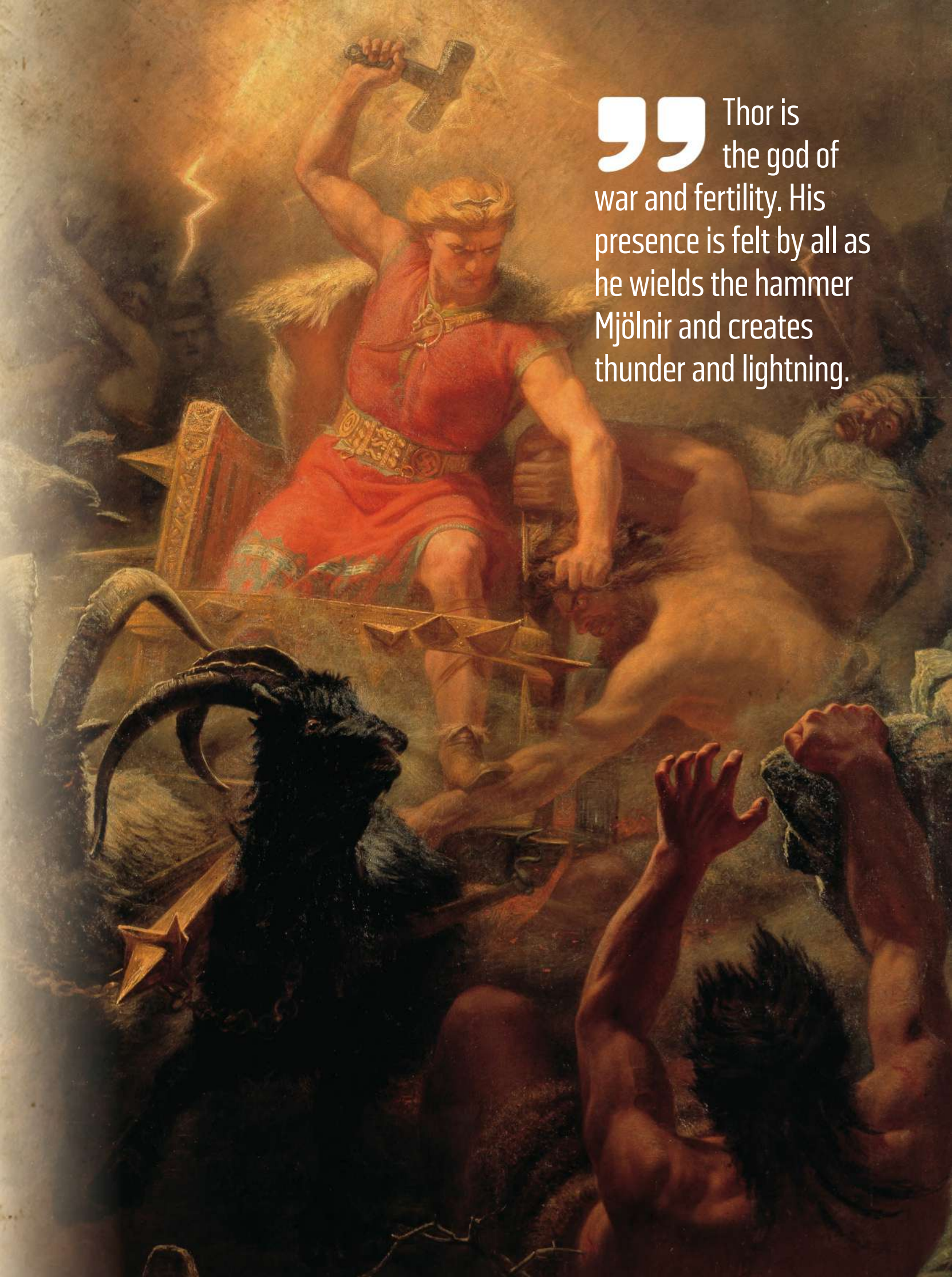
LOKI

was originally a giant but earned the gods' respect after he mixed blood with Odin. Loki is cunning and calculating, and loves to tease and play gods and giants off against each other. He can transform into any living creature and appears as a fly, a falcon, a bridesmaid and a horse, among other things.



FREYA

rules over Fólkvangr, a place for dead warriors, similar to Valhalla. She is the most beautiful of the female gods and stands for fertility, lovemaking and seiðr, a kind of magic that enables seeresses to make predictions. Freya rides in a chariot pulled by two cats.

A dramatic painting depicting the Norse god Thor slaying the serpent Jörmir. Thor, a muscular man with blonde hair, wears a red tunic and a golden belt. He holds his hammer Mjölir aloft in his right hand, with a bright lightning bolt emanating from it. He is shown in the act of crushing the serpent's head with his left hand. The serpent, a large black creature with long, curved horns, is coiled around a wooden structure. In the foreground, a muscular man with dark hair is seen from behind, his arms raised in a gesture of triumph or awe. The background is dark and stormy, with a lightning bolt striking the ground. The overall style is classical, with strong contrasts and a sense of heroic action.

” Thor is the god of war and fertility. His presence is felt by all as he wields the hammer Mjölir and creates thunder and lightning.

Life in Valhalla was an endless feast

Plenty of food, beautiful women and fighting all day long – Valhalla, the warrior's home after death, reflected the Vikings' innermost desires and beliefs about what constituted the good life.

Every Viking man dreamed of ending up in Valhalla. There, in Odin's home, they could fight every day, gorge on endless quantities of meat and quaff mead milked from Heiðrún the goat, who never ran out of the gods' drink. Admittance to Valhalla was difficult, for only the mightiest

warriors were chosen by Odin for a place in the Norse paradise. The prospect of an afterlife in Odin's hall is probably one of the driving forces behind the Vikings' contempt for death. Descriptions of Valhalla mostly came from sagas and chronicles, primarily from Britain.

The roof of Valhalla is not made of straw, like the houses the Vikings lived in during their lifetime. Instead, the roof consists of golden shields that shine magnificently in the sunlight.

The Plains of Ida lie outside the walls of Valhalla. Here the dead warriors train for hours every day to prepare for the final clash with the giants at Ragnarök. When the heroes fall in battle, the Valkyries revive them so the fighting can go on.

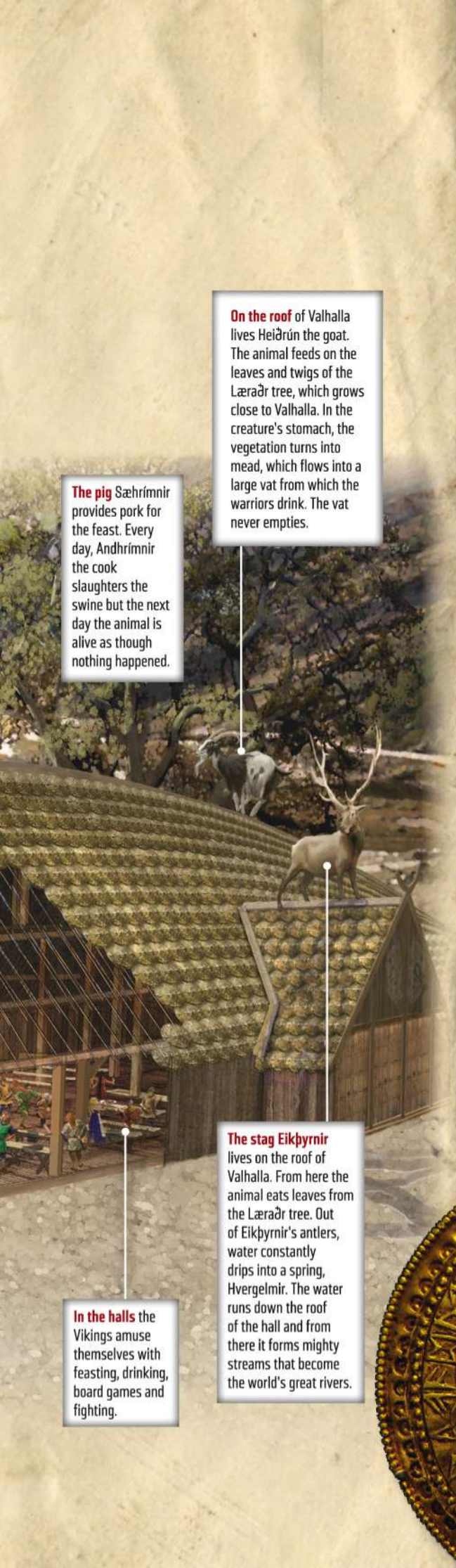
Valhalla consists of a total of 540 halls.

The doors to the halls of Valhalla are so large that 800 warriors can pass through them at once. The huge width is to ensure that all the heroes can get to Ragnarök quickly.

Beautiful Valkyries serve mead in large drinking horns to the dead warriors, who sit at long tables.

From his throne, Odin watches everything that goes on in Valhalla. On the god's shoulders sit the ravens Huginn and Muninn. The birds fly out every day to see what is happening outside Valhalla. When the ravens return, they carefully report their observations to their lord.

In front of the door, a man juggles seven short swords.



The pig Sæhrímnir provides pork for the feast. Every day, Andhrímnir the cook slaughters the swine but the next day the animal is alive as though nothing happened.

On the roof of Valhalla lives Heiðrún the goat. The animal feeds on the leaves and twigs of the Læraðr tree, which grows close to Valhalla. In the creature's stomach, the vegetation turns into mead, which flows into a large vat from which the warriors drink. The vat never empties.

The stag Eikþyrnir lives on the roof of Valhalla. From here the animal eats leaves from the Læraðr tree. Out of Eikþyrnir's antlers, water constantly drips into a spring, Hvergelmir. The water runs down the roof of the hall and from there it forms mighty streams that become the world's great rivers.

In the halls the Vikings amuse themselves with feasting, drinking, board games and fighting.

pork. The meat came from the pig Sæhrímnir, who lived in the great hall. The swine was slaughtered every day by the cook Andhrímnir, who then cooked the meat. The hungry warriors could eat their fill, because Sæhrímnir's meat never ran out. Best of all, the beast returned the next day perfectly fed, ready to be turned into another feast for the Vikings. Pigs and goats were the Vikings' most common domestic animals, so they naturally found their way into mythology.

When the Vikings weren't eating, they were fighting each other on the Plains of Ida, which lay outside Valhalla. The Vikings enjoyed the clashes and were no longer in danger of dying. In fact, if they fell in battle, the Valkyries simply revived the heroes so they could continue the fight.

But the battlefield exercises were not just entertainment for the Vikings. The warriors were also in training for Ragnarök, the great clash between the gods and the giants, evil beings who dwelt in Utgard – a terrible event that spelled the end of the known world.

Earth would perish in Ragnarök

Ragnarök would be heralded by disasters: the three-year Fimbulwinter – a series of icy winters with no spring or summer in between – along with earthquakes, floods, war, disease and moral decay. All the evil forces of Hel would then invade Asgard, the realm of the gods, where Valhalla was located, and fight to the death. The gods would lose and Asgard and the rest of the world would go up in flames, the myth goes. Out of the ashes, a new world would arise, with the surviving gods and the children of the fallen deities. These offspring would find the golden games of the ➤

” Valhalla offered everything the Viking valued while he lived: food, fighting and mead in abundance.

By the Iron Age, there was jewellery – known as bracteates – that depicted an Odin-like god sitting on a horse.



Sheep and slaves went to the grave

The Vikings took what they could afford with them to the underworld. Wealthy Vikings took slaves, animals, riches and even an entire Viking ship with them to Valhalla. Others had to make do with stones to symbolise a Viking vessel.

Viking ship

The noblest Vikings were buried in a ship. The less distinguished could have a burial chamber under a mound. Finds show that Vikings often collected stones, which they arranged in a boat shape over the grave. In this way, everyone could be buried in a ship. After burial, the bereaved drank copious amounts of mead, which the Vikings associated with the afterlife in Valhalla.

At the Anundshög burial mound in Sweden, a 100-metre-long arrangement of stone blocks symbolises a ship.

Animals

Before burial, the dead were given new clothes. If the deceased was rich, the survivors slaughtered animals such as horses, sheep and pigs, which the dead took to their grave as a sacrifice to the gods. Men were given weapons, women jewellery. Less wealthy Vikings had to make do with their favourite knife and some food.



Slaves

If the family was wealthy, they might sacrifice a slave to accompany their master in death. The slave had their throat cut, head chopped off or hands and feet bound before being forced into the grave alive.



Sources report that slaves had their hands tied behind their back before being sacrificed.

gods lying in the desolate grass of Asgard and from them create a new order where good reigned. Two people – called Líf and Lífþrasir – would run away during Ragnarök, hide in the forest and survive by drinking dew. Their descendants would populate the new world.

Historians know the myth of Ragnarök from the Icelandic *Edda* poems of the thirteenth and fourteenth centuries. The poem ‘Prophecy of the Seeress’, which describes how a fortune-teller predicts the future to Odin, depicts the course of Ragnarök in detail. Researchers believe that the end-of-the-world story, like the description of Valhalla, dates back to the sixth century and was influenced by Christianity.

In order for a Viking to fulfil his dream of Valhalla, he had to die in battle. The warrior was personally chosen by Odin, the god of war and ruler of Valhalla. The one-eyed god was, the Vikings believed, always present on the battlefield and decided who would win and who would lose. “Odin owns you all!” the Vikings therefore shouted, before hurling themselves at the enemy with flashing swords. Odin carefully watched how each warrior behaved.

Only those who acted bravely and showed contempt for death were judged by Odin worthy of a place in Valhalla. However, an honourable death on the battlefield was not enough to ensure the Viking warrior a comfortable existence in the afterlife. Archaeological finds show that the Vikings took plenty of food to their resting place. Chieftains and other wealthy people were also provided with horses, dogs and other animals. Riding gear, weapons, bowls, coins and breastplates were also popular grave goods.

Rich got biggest mound of earth

The grave itself took several forms, because burial customs varied according to taste and financial means. Whether the Viking was buried or burned does not seem to have had any religious significance. Some Norse buried their dead in a wooden chamber in a burial mound. The Vikings piled up earth into a hummock, in which they made a cavity that they reinforced with planks. They placed the dead in the room together with grave goods, before covering the sides of the chamber with soil. The more noble the deceased, the larger the pile of earth.

It was particularly dignified to be buried in a boat. A ship would carry the dead to the next world and also signalled wealth and status. One of the most opulent boat burials known to archaeologists is the Norwegian Oseberg ship. The vessel, which

contained two female skeletons, had fine wooden carvings and enamelled brass fittings. It was also equipped with horses, sledges, woven rugs, a large selection of kitchen utensils and other items that the dead might need for their journey, and which served as an offering to the gods. The less wealthy had to make do with a symbolic ship – a stone structure shaped like a boat on top of the tomb.

Archaeologists have found large burial grounds with this type of tomb in both Sweden and Norway, but few ship interments. Researchers hope that ground-penetrating radar (GPR) surveys will find more. All the indications are that they are correct, because in 2018 a team of archaeologists using GPR discovered what they suspect is a ship burial from the Viking Age. But the grave has not yet been excavated.

Slave woman died with her master

For the wealthiest, the burial ceremony itself was an extravaganza that lasted several days and could end with the ship that bore the dead ➤

Equipment | Valhalla cauldron

ELDHRÍMNIR is the name of the cooking pot in Valhalla in which the pig Sæhrímnir is cooked every night.



MEAD Andhrímnir is a cook in Valhalla who also brews mead in his cauldron. His name means "the one exposed to soot".

being set on fire. The vessel was either pushed out into the water, where it disappeared under the waves, or burned on the beach.

Such a farewell was witnessed by the Arab diplomat Ahmad ibn Fadlan when, in AD 921, as an envoy from the caliph in Baghdad, he met a group of Vikings on the **Volga**. Ibn Fadlan watched curiously as a dead chieftain was laid in a temporary tomb for ten days. Meanwhile, the bereaved prepared the ceremony. The women sewed fine clothes for the deceased, and the men pulled his longship ashore. "Four posts of birch or other wood had been driven into the ground," said Ibn Fadlan.

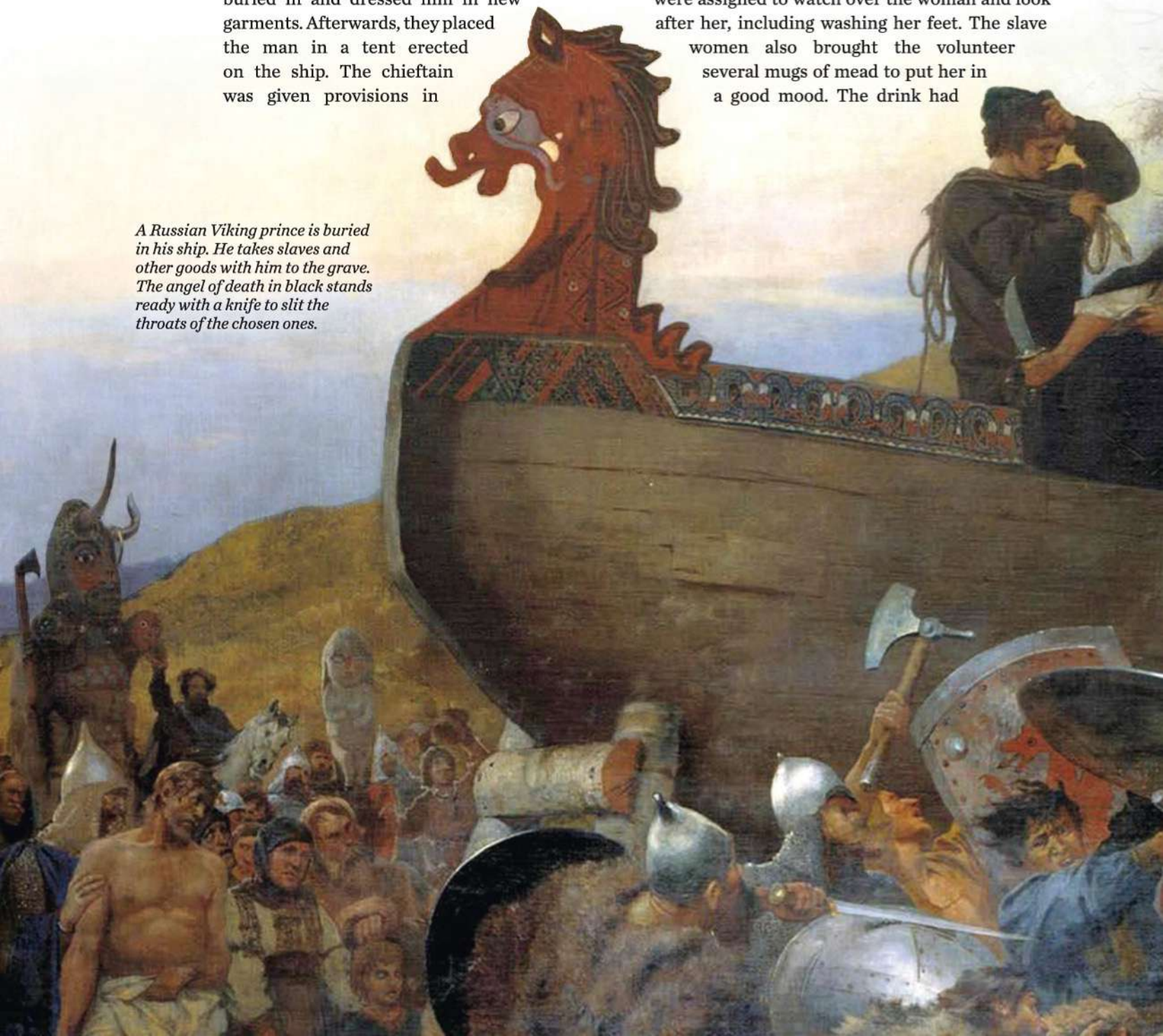
The bereaved brought the deceased from his temporary grave, removed the clothes he was buried in and dressed him in new garments. Afterwards, they placed the man in a tent erected on the ship. The chieftain was given provisions in

the form of mead, fruit, bread, meat and onions, along with his weapons and animal sacrifices:

"Then they placed his weapons beside him. Next they took two horses and made them run until they were in lather, before hacking them to pieces with swords and throwing their flesh on to the boat. Then they brought two cows, which they also cut into pieces and threw them on to the boat. Finally they brought a cock and a hen, killed them and threw them on to the boat as well," ibn Fadlan related.

The ceremony also included a human sacrifice. "Who will die with him?" the dead chieftain's survivors asked the nobleman's slaves as they prepared the burial ceremony. "I will," a female slave replied immediately. Two other slave women were assigned to watch over the woman and look after her, including washing her feet. The slave women also brought the volunteer several mugs of mead to put her in a good mood. The drink had

A Russian Viking prince is buried in his ship. He takes slaves and other goods with him to the grave. The angel of death in black stands ready with a knife to slit the throats of the chosen ones.



its effect, for the woman spent each day “drinking and singing, happily and joyfully”.

The slave’s joy probably soon abated, because she was then sent from tent to tent so that the men could have sex with her.

“Tell your master that I only did this for your love of him,” the men said as part of the ritual rape. Historians believe that the sexual act was to ensure that semen, and therefore life, was passed on to the dead chieftain.

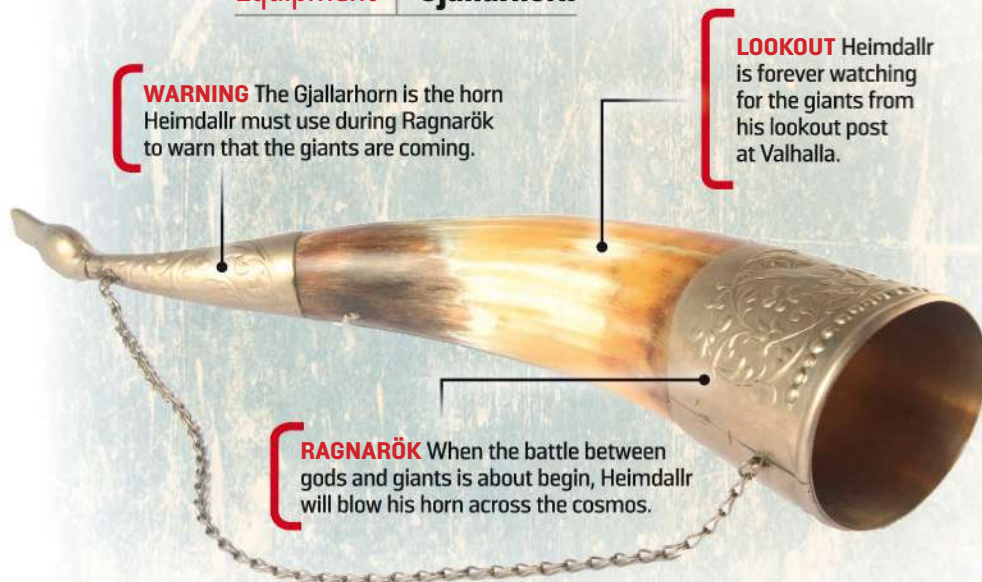
Later, the woman was taken on to the ship, where a woman whom ibn Fadlan referred to as the “Angel of Death” killed the slave girl with a dagger. The violent death was, historians believe, a symbolic initiation into Valhalla. Human sacrifice was not a regular part of Viking burial

rituals, but evidence suggests that it was not uncommon, either. Excavations even seem to reveal that the Vikings cut the heads off slaves or forced them into the grave alive, with their hands and feet bound.

A recurring ritual, however, was the funeral wake. While the Vikings set fire to the ship and the flames consumed the chieftain and slave woman, those left behind got drunk on mead. Indeed, when the bereaved began preparing for the ceremony, they set aside a third of the deceased’s fortune to brew the drink. The binge was a high point for the Vikings, not only because they were seeking ►



Equipment | Gjallarhorn



solace, but because by drinking they created a link with the deceased and Valhalla.

While the Vikings' ideas about the world of the gods, Valhalla and Ragnarök were imaginative and full of drama, everyday worship was probably more restrained. The Vikings honoured their gods at home on the farm or further afield within the natural environment.

Larger celebrations, such as the *blót* – a sacrifice to the gods, which took place once a year – were held at the chieftain's house. Here the Vikings slaughtered and ate animals, and feasted in the great hall. The Vikings also drank mead. The sacrifice was to ensure a rich harvest and a year of peace and prosperity for all.

In the same way, Vikings made sacrifices to the gods to obtain favourable trade: "As soon as their boats arrive at this port, each of them disembarks, taking with him bread and meat, onions, milk and *nabidh* [an intoxicating beverage], and he walks until he comes to a great wooden post stuck in the ground with a face like that of a man, and around it are little figures. Behind these images there are long wooden stakes driven into the ground. Each of them prostrates himself before the great idol, saying to it: 'Oh my Lord, I have come from a far country and I have with me such and such a number of young slave girls, and such and such a number of sable skins...' and so on, until he has listed all the trade goods he has brought. [Then he adds:] 'I have brought you this gift.' Then he leaves what he has with him in front of the wooden post [and says:] 'I would like you to do the favour of sending me a merchant who has large quantities of dinars and dirhams and will buy everything I want and not argue with me over

my price.' Then he departs," ibn Fadlan wrote.

Temple in Uppsala

Historians agree that the Vikings had neither priests nor churches but they may have had temples, attracting pagans from near and far. In the 1070s, the chronicler Adam of Bremen described in the *Gesta Hammaburgensis* a "very famous temple called Ubsola [Uppsala]" near the Viking market town of Sigtuna in Sweden.

Visitors worshipped statues of the gods Thor, Odin and Freyr. But historians question Adam of Bremen's account. They say that the Christian chronicler seems to have borrowed from the Old

Testament description of King Solomon's Temple.

Similarly, most doubt that the human sacrifices Adam describes took place in the temple. However, the majority of archaeologists agree that there was some kind of sanctuary at Uppsala. If the Vikings did have a great temple, it was probably located in Gamla Uppsala, a village outside Uppsala itself.

The area has been inhabited for at least 2,000 years, and archaeologists estimate that it originally contained 2,000–3,000 burial mounds. Excavations show that most of the graves date back to the Iron Age and the Viking period. Finds also show that Gamla Uppsala was a religious, political and economic centre from the third and fourth centuries. Here the Swedes held *things* – meetings at which local leaders made laws and meted out punishments – and chieftains held a sacrificial feast in February and March. At the same time, locals held a fair, and the chieftains organised the Viking fleet for the coming raids and expeditions.

Swedish archaeologist Sune Lindqvist found a series of post holes indicating the outline of a large building during an excavation under the church in Gamla Uppsala in 1926. However, later investigations showed that the holes belonged to several buildings, not one large temple. GPR and other studies show wooden structures under the medieval church. Some archaeologists believe that these are the remains of a Viking temple, while others think they are from an early Christian church. It is well known that churches were often built on ancient pagan sacrificial sites.

Only future excavations will confirm whether Gamla Uppsala once housed a grand temple to Odin, Thor and other Norse deities. ■

The Vikings had a close relationship with the gods

- The gods were **part of Viking life** and everyday life for the Norse.
- Vikings made sacrifices to and **worshipped the gods**.
- The Norse made **images of gods** such as Odin from the eighth century.
- Vikings believed that **life continued after death** and prepared for the afterlife.
- The Vikings believed that the **gods could help** with tasks and problems, such as trade deals.

50

The number of gods in Norse mythology is more than 50.

? WE NEED ANSWERS

Where did the gods come from?

1 The Vikings left no accounts or depictions of the gods before the eighth century. Historians therefore do not know when the Viking gods came into being, where they

came from or what the Vikings thought about them. Most researchers believe that **Norse paganism is a mixture of gods, myths and legends from several cultures**. Some believe that the gods in

their basic form arrived in Scandinavia in the first century AD, but that the world of the Norse gods only developed its own distinctive identity around the beginning of the Viking Age.

Was human sacrifice common?

2 From the Arab traveller ibn Fadlan, we know that the Vikings sacrificed humans in connection with funerals. Finds show that this was not a unique case. However, researchers do not know how widespread the phenomenon was. **Many Christian chroniclers report sacrifices of children, for example**. Researchers have discovered that some of these accounts are consistent with reality, through the discovery of skeletons at, for example, the great manor of Tisso in Denmark. Other stories are most likely made up. Exactly how widespread human sacrifice was historians still do not know.

The Vikings definitely sacrificed animals to the gods. How often humans were sacrificed, however, is uncertain.



*The Danish ring fortresses
were built with impressive
mathematical precision.*



WHO BUILT THE RING FORTRESSES?

King Harald Bluetooth's fortresses were a feat of engineering that required the kingdom's best mathematical minds, thousands of workers and timber in unimaginable quantities. A few years after construction, however, the strongholds stood empty – leaving archaeologists with countless questions.

At several places in Denmark, traces in the ground bear witness to gigantic buildings erected around the year AD 980. The structures were huge ring fortresses built by Harald Bluetooth.

The largest of these castles, Aggersborg in North Jutland, measured 240 metres in diameter and stood as a forbidding monument to the king's power in the tenth century.

Archaeological studies show that the fortresses were built according to strict mathematical principles, with the gates placed with perfect precision at the four points of the compass, the ramparts built according to advanced engineering concepts, and the streets laid with solid oak.

Today, very little remains of the original ring fortresses, which are not mentioned in any written sources. Therefore, piecing together the past and purpose of the strongholds is challenging, and only in recent years have archaeologists managed to get a little closer to the truth about the Viking fortifications. Who built them, what they were used for, how they were constructed and why they were abandoned a few years after they were built are some of the questions researchers are trying to answer. To solve the mystery, archaeologists have only traces

of palisades, houses and streets, and thousand-year-old pieces of wood at their disposal. Through meticulous examination of the remains, historians are trying to tell the story of the ring fortresses. Some answers can be traced back to five years before construction even started.

Germans captured Danevirke

In 974, an army from the **Holy Roman Empire** attacked the Danish defensive fortress of Danevirke. Sources say that warrior after warrior poured over the ramparts. With arrows, axes and

swords, the Danish Vikings were slaughtered as they desperately tried to defend the Danevirke fortifications. The air resounded with the screams of men who were expedited to Valhalla with deadly blows from the Germans.

Pools of blood slowly seeped into the earth with which King Harald Bluetooth had carefully – but unsuccessfully – reinforced the ramparts. The Danevirke was overrun by the enemy, and the Holy Empire captured the important trading town of Hedeby and demanded huge war reparations that threatened to send the Danish kingdom into penury.

By 974, Harald Bluetooth was king of Denmark. While his father, Gorm the Old, had probably only ruled over the Jutland region, Harald was king of what we know today as Denmark, as well ➤

” The gates were placed with perfect precision at the four points of the compass.

THE HOLY ROMAN EMPIRE

was established by Otto I when he was crowned Roman Emperor in 962. The empire consisted of a patchwork of states in western and central Europe.

Ring fortress was mathematical marvel

Harald Bluetooth's strongholds were built with extreme precision, revealing the Vikings' mastery of mathematics and construction skills to have been much better than previously believed.

Ring fortresses around Denmark were intended to consolidate the Viking king's power. The best preserved, Trelleborg, is located near Slagelse. By analysing post holes and other traces in the ground, archaeologists have been able to conclude that Viking castles were built according to strict geometric principles. The four gates faced the points of the compass perfectly, and two timber-covered roads met at a perpendicular cross in the middle of the stronghold. The ramparts, moats and houses were also symmetrically placed around the centre, and the incredible precision of the construction reveals that a fixed scale was used. Archaeologists used to believe the Vikings used the Roman foot, but research from Trelleborg revealed that the fortress's dimensions follow its own scale, a Trelleborg foot, of 29.3 centimetres.

Excavations revealed that Trelleborg's rampart was 180 metres in diameter and may have been as much as five metres high and 17 metres deep. The rampart consisted of earth, wood and stone. Around 25,000 cubic metres of earth were used at Trelleborg – enough to fill 1,600 modern lorries.

The stronghold's four gates faced the four compass points exactly.

The four blocks, each with four houses, were placed symmetrically and formed squares.

Longhouse

Workshop

The external buildings were located so that their long axis pointed towards the centre of the fortress.

Streets crossed each other in the centre, dividing Trelleborg into four sections at 90 degrees to each other.



Wooden streets were heart of fortress

Two long streets intersected in the centre of the castle, while another ran around the inside of the rampart. The streets were made of wood and very strong. First, the builders dug three posts into the ground, which were connected by a long crossbeam, making the street three metres wide. Then they laid joists alongside, across which they laid thick beams for the road itself.



Gate

N

A fixed unit of measurement, a modification of the Roman foot, which was about 29.5 cm, was used throughout the construction of the fortifications. For example, the houses in the inner stronghold are 100 feet long, while the outer houses are 90 feet.

as parts of Sweden and Norway. Like his father, Harald had an eye for both war and politics, and was involved in Gorm's governance from an early age. And when the old king died in 958, all the signs were that the king's son would make a fine ruler.

Denmark was a powder keg

Harald inherited not only Gorm's title, however, but also his political problems. Gorm may have been king, but his position was not as assured as the title suggests. In the tenth century, a king was merely a leading **chieftain**, regarded by other chieftains as first among equals. Kingship was not automatically inherited, so Harald's power was not a given – he had to fight for it. Hostility lurked everywhere in the Danish kingdom, and any misstep could result in the ruler's downfall.

As if the internal conflicts weren't enough, Harald also inherited a threat from the south, where first Germanic tribes and later the Holy Roman Empire lurked. In order to thwart his powerful neighbours – who were likely to attack the pagan Danes under the pretext of a Christian crusade – Harald converted to Christianity. He also went on a conquest south of the border, but after a failed campaign, was put on the defensive before the Danevirke was taken. The defeat in 974 sent Harald Bluetooth into a deep crisis. He knew that the throne of a king who could not defend his country or his reputation was insecure.

Harald's father, Gorm the Old, had originally been one of the kingdom's chieftains, but after being an advisor to the English monarch, he had won the title of Denmark's first king.

But it was all in vain. In 974, Harald was left with an overrun Danevirke and a smouldering rebellion among Denmark's chieftains, who believed that Harald was too weak to lead the kingdom and had taken a throne to which he had no claim. The king had to act if his command was not to slip from his grasp. To demonstrate his power, he embarked on a project that would strengthen him militarily and quell any uprising: Harald began fortifying Denmark with gigantic ring fortresses, the likes of which had never been seen before in Scandinavia.

No sources mention the forts

None of the Danish ring fortresses are mentioned in contemporary sources. Historians' knowledge of these unique defences is therefore based primarily on archaeological excavations. Dating of pieces of wood found during digs shows that the fortresses were built from wood felled around 980. The year was determined by means of dendrochronology — counting the rings in

CHIEFTAIN

or chieftain was the term used to describe the most powerful men in the local communities. The chieftain was elected by the freemen of the community.

Continued on page 98

From **400** to **2018**

DANEVIRKE INTENDED TO DEFEND THE VIKING LAND

While the Viking fortresses secured power from within, the Danes had built an enormous rampart to protect the kingdom from enemies to the south. The Danevirke proved useless, however, and was invaded by everyone from the Saxons to the Nazis.



AD 400-500 Carbon-14 analysis shows that the first simple earthwork was built in AD 500. The rampart stretches from the Schlei fjord in the east to the marshlands and the Eider River in the west.

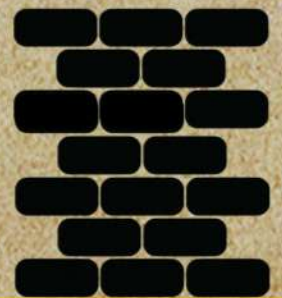


AD 500-700 The ramparts are built higher and steeper. The main rampart is about two metres high and 12 metres wide.

1848 During the First Schleswig War, the ramparts are again used for military purposes, including during the Battle of Isted in 1850, when the Danes fortify the Danevirke with redoubts, cannons and parapets for the infantry.



1300 The main rampart is fortified with *Valdemarsmuren* (Valdemar's wall) – the first large brick wall in Denmark. The ramparts are then left to decay for centuries.



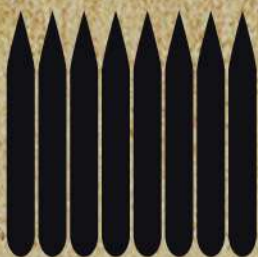
1864 The ramparts are modernised and expanded to 27 redoubts manned by 38,000 men. Yet they must be cleared when the Second Schleswig War breaks out.



1944 During World War II, after the Danevirke has been abandoned for a long time, the Germans decide to convert it into an armoured defence to protect against an Allied attack through Jutland. Danish archaeologists stop the work by contacting Heinrich Himmler in Berlin.



737 Archaeologists can precisely date when the ramparts are reinforced with a wooden palisade. Analysis of tree rings shows that this happens in the year 737.



800 Historical sources mention that King Godfred builds a fortification from sea to sea. The new Danevirke is built with a mud-brick wall and has only one opening through which traders can pass.

960 Harald Bluetooth extends the main wall, so that it is now about five metres high and 20 metres wide. Construction begins a few years before the building of the great ring fortresses.



1080 Under King Canute IV the Holy, the ramparts are extended again.



974 The Danevirke is attacked by Emperor Otto II's troops. The Germans manage to penetrate the defences, and Hedeby is captured.

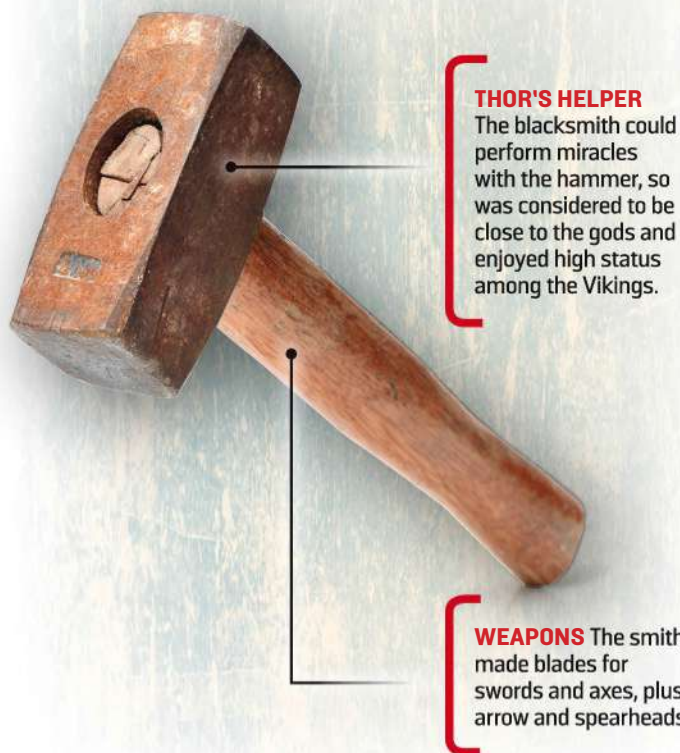


1950 The remains of the Danevirke are protected in 1950. Eight years later, the rampart is recognised as a historical monument.



2018 Danevirke and the former Viking village of Hedeby are recognised as a UNESCO World Heritage Site.

Craftsmen | Blacksmith



the wood. Although the concept is simple, the technique is one of the best and most accurate tools for dating finds. In the past, the method was just used to tell the age of a tree when it was felled.

Because tree rings show how much the tree has grown in a particular year, however, researchers have now been able to devise a fairly accurate checklist for dating them. Harsh winters leave their mark, as do major events such as volcanic eruptions and so on. Today, a global profile of tree rings exists, so researchers can date wood quite accurately by looking at the width and shape of the rings. Coupled with carbon-14 analysis, archaeologists can therefore date the construction with a fair degree of accuracy to around 980.

The function of the forts is more difficult to explain. However, the locations of the structures have given historians a clue as to the intention behind them. All the fortresses are found inland – far from the coast – relatively distant from borders and spread around the country.

The locations are seen by historians as a sign that the strongholds were not intended to act as defensive fortresses, like the Danevirke, to keep out external enemies. More likely, their function was to show strength internally and act as military support points for Bluetooth when he had to defend himself against rebellious Danish

chieftains. Researchers have no doubt that the fortresses were fearsome defences against any rebellious chieftain. The site of each fortification was chosen with great care, so they were easy to protect against attack. Three fortresses were located where two rivers meet, providing protection from three sides. The only fort that was not in a river fork was so difficult to sail to that it was almost impossible to attack from the water.

Similarly, the waters leading up to the strongholds were so narrow that ships could not attack in formation but had to sail in a long line – a vulnerable position for a fleet. Whether the attack came from land or water, the scouts at the forts had a good view and could keep an eye on what was happening around them and call in reinforcements. In other words, the fortresses served their purpose from the start.

Trelleborg laid Zealand bare

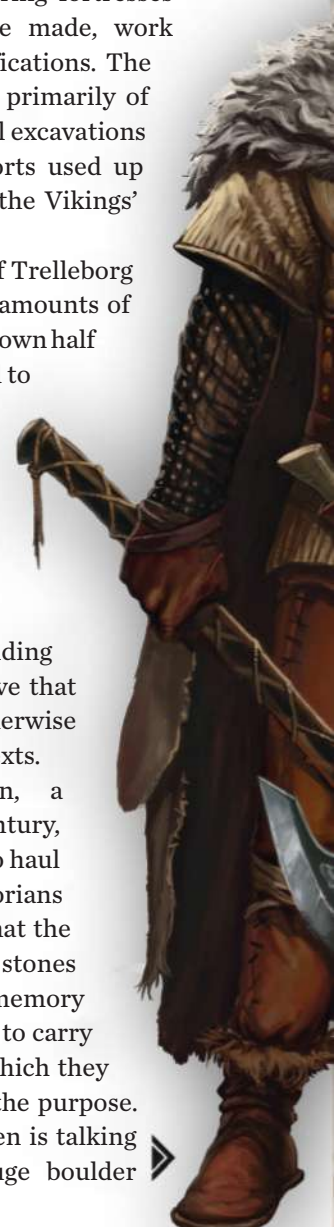
After the decisions to build the ring fortresses and where to locate them were made, work began on building the huge fortifications. The strongholds may have been built primarily of earth and wood, but archaeological excavations show that Harald's impressive forts used up enormous resources and pushed the Vikings' technical skills to the limit.

For example, the construction of Trelleborg near Slagelse required such huge amounts of timber that the Vikings had to cut down half of all the oak woodland on Zealand to build the stronghold.

The fortifications were therefore located near forests, which could ensure supplies of timber for the extensive construction.

Historians don't know who was responsible for the day-to-day building work, but some researchers believe that an explanation is hidden in otherwise meaningless passages in ancient texts.

For example, Sven Aggesen, a chronicler from the twelfth century, said that the king sent the army "to haul the immense rock". Some historians believe that the account's claim that the king forced the Danes to haul large stones may be a recollection of a distant memory that Harald forced the population to carry out large construction works of which they did not immediately understand the purpose. More likely, however, Sven Aggesen is talking about the Jelling stone, the huge boulder



Kingdom was fortified with bastions

The great ring fortresses were located in strategically important places in central parts of the kingdom, protected by water and impassable land.



NORTH SEA

Aggersborg was much larger than the other Danish ring fortresses and contained as many as 48 longhouses. The stronghold has been destroyed by farming and is not very well preserved.

Aggersborg

Fyrkat

Fyrkat near Hobro is a smaller version of Trelleborg. Archaeologists have excavated most of the stronghold.



Trelleborgen was built in the ninth century, according to carbon-14 dating. This means that the fort - and nearby Borgeby - are not contemporary with Danish ring fortresses.

Nonnebakken

Trelleborg

Borgring

Trelleborgen

BALTIC SEA

Nonnebakken is no longer visible, but in around 1900 part of the rampart could still be seen. Archaeological investigations have revealed the remains of a circular wall and a moat.

Borgring was a headache for researchers for a long time. They guessed that there must have been a ring fortress with access to the eastern coast of Zealand, but only in recent years have archaeologists been able to conclude that Borgring dates from the tenth century and was in all likelihood built at the same time as the other ring fortresses.

Trelleborg was the first ring fortress to be excavated, in 1936, and today is the best known of the Danish ring forts. The inner stronghold has a diameter of 136 metres.



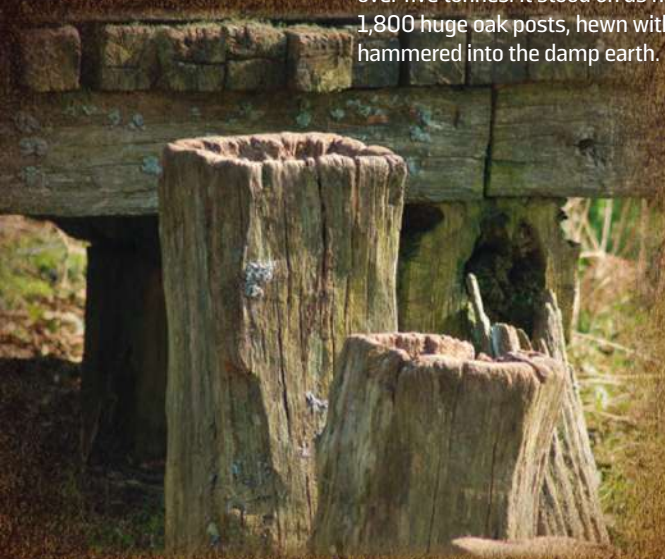
Between 500 and 800 elite warriors manned each ring fortress.

Traces of Harald Bluetooth can be seen 1,000 years later

Fortresses, bridges and churches – Harald Bluetooth was behind a number of impressive buildings, some of which have survived to this day.

Bridges

One of Bluetooth's major projects was the bridge over the Vejle valley a few kilometres south of the royal town of Jelling. The bridge, which was built at about the same time as the ring fortresses, was 5.5 metres wide and could carry a load of over five tonnes. It stood on as many as 1,800 huge oak posts, hewn with axes and hammered into the damp earth.



Jelling stone

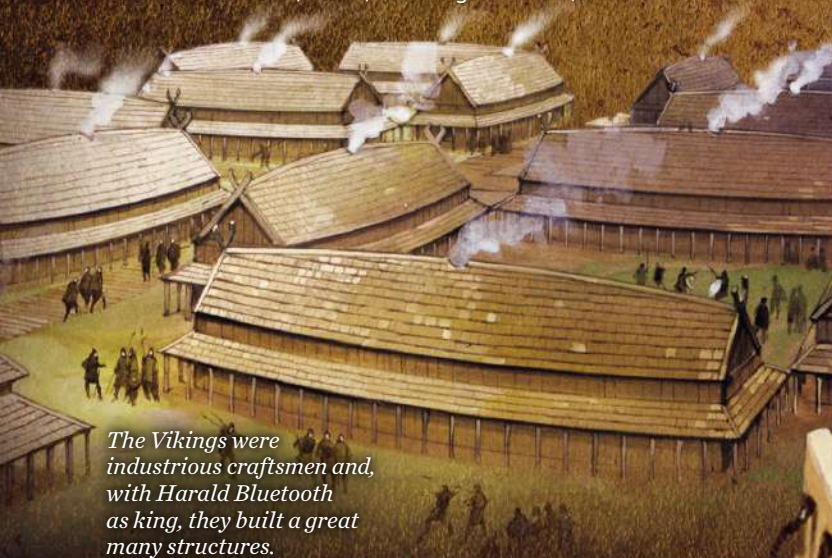
In addition to the ring forts, Harald erected a large rune stone at his royal seat in Jelling in southern Jutland. On the stone, which was officially a memorial to his father, Gorm the Old, and his mother, Thyra Dannebod, Harald confirmed his status as "Harald who won for himself all of Denmark and Norway and made the Danes Christian".



The Jelling stone is the most well-preserved reminder of Harald Bluetooth's time as king.

Churches

To demonstrate that he was serious about converting to Christianity, the newly baptised Harald built a number of churches. Under the present stone church in Jelling, archaeologists have found a wooden church from Harald's time. According to lore, Harald also built the Trinity Church in the later royal town of Roskilde, where, according to sources, he was buried.



The Vikings were industrious craftsmen and, with Harald Bluetooth as king, they built a great many structures.



that Harald Bluetooth had hauled up a hill near Jelling in Jutland to secure his legacy. It may well be, however, that Harald's army was indeed put to work on the construction. We do know that a rebellion among the proud warriors began to fester around 980. They may have been dissatisfied with having to spend time and effort shovelling earth rather than fighting and plundering.

Design was Christian

No matter who Harald commissioned to build the fortresses, the planning and execution testify to incredible mathematics and engineering expertise. All the fortifications were built to the same plan – a circular, geometrically accurate earthwork surrounded by a moat.

Researchers believe that the very design of the strongholds – a circle with streets crossing each other at the centre – has its origins in what are known as wheel maps. These maps were the way the world was represented at the time. According to the cartographers, the world was circular and divided by rivers that crossed at the centre of the world: the holiest city of Christianity, Jerusalem. The primitive maps were not intended for travel, but simply as a visual symbol of the newly emerging Christian world view.

Harald – who viewed himself as the king who had Christianised the Danes – probably used the shape to mark his allegiance to the new religion and also perhaps to seek God's protection.

Vikings were skilled builders

Ringfortresses like those built by Harald Bluetooth in Denmark are known in a few other places in the world. In Scania, Sweden – which belonged to Denmark under Harald – traces of two more ring fortresses have been found, but researchers are not sure of their age and construction; they may pre-date the Danish ring fortresses.

In the Netherlands and Belgium, archaeologists have found remains of castles whose layout is similar to the Danish forts, but these are about 100 years older. They may have inspired Harald's builders, but the layout of the Danish ring fortresses is much more precise and geometric.

Harald's castles are architectural gems and bear witness to the Vikings' great construction skills. In order to build the defences so accurately, the Vikings must have been able to make complicated geometric calculations and had an in-depth knowledge of the properties of soil and timber

as building materials. For example, earthworks will collapse if they are not constructed correctly. The Vikings therefore built the circular wall over an internal skeleton of vertical and horizontal timbers, which held each other in place and prevented slippage.

Frame made from 1,800 ash trees

Building the solid rampart took an unimaginable number of man-hours. The task of moving the soil alone must have worn out even the most hardened Viking. At Trelleborg, over 20,000 cubic metres of soil were used – enough to fill 1,600 lorries.

To hold the soil in place, the workers wove together 1,800 young ash trees, which formed the inner frame of the rampart. Horizontal beams ran

across the rampart, connecting the outside and inside. The outside of the rampart was then clad with oak planks, and in total around 8,000 large oak trees were used to construct the palisades, houses and roads. Most of the oak trees were about 200 years old when they were felled, with a diameter of 120–130 centimetres and a height of eight to ten metres.

The trees helped to create the

ramparts that kept out the enemy. The only way visitors could enter the stronghold was through one of the ring fortress's four gates, which were made of timber and up to six-metre-wide stone foundations. The stone settings suggest that wooden towers or gatehouses stood on top.

Around the outside, the workers had dug a moat, and the bridge leading across was placed between the two main gates, so that an attacking enemy was vulnerable to stones, spears and arrows for as long as possible before reaching the entrance. From the four gates, which were placed exactly at the four points of the compass, two wooden streets ran through the inner area of the fortress.

The precise alignment of the gates has long been one of the ways in which scholars have defined a ring fortress. In the four Danish examples – Fyrkat, Trelleborg, Aggersborg and Nonnebakken – the gates are positioned so that they directly face north, south, east and west. Three of the other ring fortresses – Borgring in Denmark and Trelleborgen and Borgeby in Sweden – have gates that are offset by a few degrees in relation to the compass points.

This is one of the reasons why academics have long doubted whether the last three strongholds should be considered ring fortresses. But most people now believe that the shift was made for

In order to build the defences so accurately, the Vikings must have been able to make complicated geometric calculations.

➤ *Continued on page 104*



INTERVIEW

Jens Ulriksen, head of research,
Museum Sydøstdanmark.

Jens Ulriksen was the excavation supervisor at Borgring near Køge. He has studied life around the ramparts before, during and after the establishment of Borgring.

Swedish ring forts are still a mystery

Unlike the perfect Danish ring forts, the Swedish ring fortress Trelleborgen differs first and foremost by not being geometrically circular. The stronghold is lopsided, and the gates have not been placed so as to divide the fortification into four equal quadrants.

? Have archaeologists been able to date the Swedish ring fortresses. If not, why not?

Trelleborgen has been dated partly by means of carbon-14 analysis and partly by observations of the relationship between the remains of the fort and the older and younger settlements on the site. The fact that something happened on the same site both before and after the fortress means that there is often uncertainty associated with carbon-14 dating. Traces of older activity (charred grain, charcoal, small animal bones) can be mixed in with younger sites and vice versa, not least when dating charred grain or small pieces of charcoal that may have been moved around by mice, moles, worms and the like. The excavations have concluded that there was one building phase in the ninth century and another in the tenth century.

The carbon-14 method has also been used in an attempt to date Borgeby. Of three samples, two are from the layer under the rampart and they have been

dated broadly to the Viking Age. The last sample was dated to the Late Roman Iron Age, 700–800 years before the Viking Age. The results show one of the weaknesses of carbon-14 dating.

? Historians often consider the five Danish ring fortresses as parts of a unified defence system (probably under King Harald Bluetooth). Does it make sense to see the Swedish fortifications as part of the same?

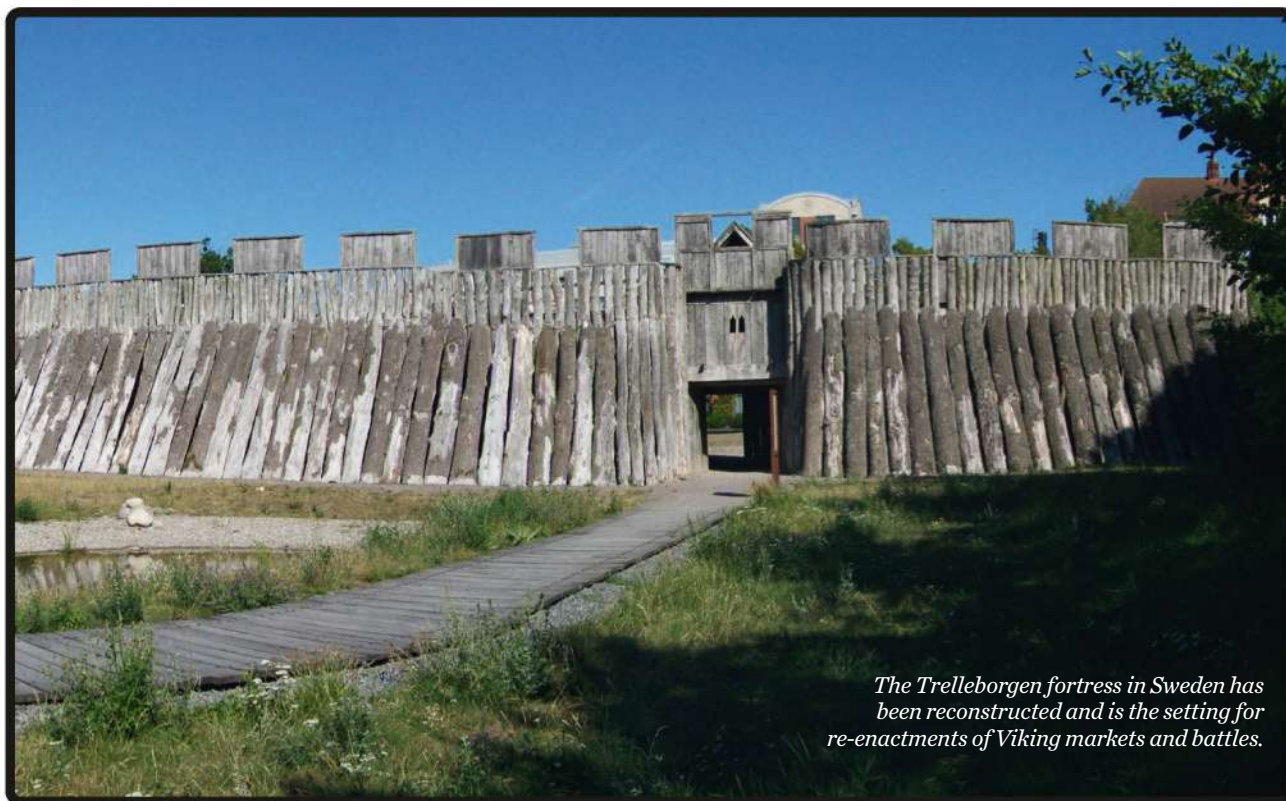
Architecturally, Trelleborgen in Skåne, Sweden, has to be distinguished from the other ring fortresses, because their strict mathematical design points to the fact that all the geometric monuments in Denmark built by Harald Bluetooth belong together. In my opinion, it is not so much the defence aspect that should be emphasised, but rather the monuments should be seen as symbols of a new, Christian royal power that is trying to manifest itself in its own unique way. Trelleborgen in Skåne is

a wildcard in this context, because it does not fit into the geometric picture. The stronghold can be seen as a local chieftain's attempt to copy the king without having the surveying skills to map out the geometry. However, the somewhat unclear dating conditions at Trelleborgen make it difficult. If the carbon-14 dates are correct, the first version of the castle seems to be from the ninth century – somewhat older than the Danish fortresses.

? Why did the builder choose to build the fortresses in these particular locations (Borgeby and Trelleborgen, in Sweden)?

Trelleborgen is situated at a landing place right on the Baltic Sea. There is the possibility to get ashore and its access to the sea may have dictated the location of the fortress. Borgeby is not far from Löddeköpinge, where textiles were produced on a large scale in the Viking Age, probably including sails. In addition, Borgeby has a ford over the Kävlinge River, and the location at important crossings over waterways

The Swedish ring forts of Trelleborgen and Borgeby are possibly older than the Danish ones.



The Trelleborg fortress in Sweden has been reconstructed and is the setting for re-enactments of Viking markets and battles.

would have been crucial for traffic to and from the ring fortresses.

? Do archaeologists know who built the Swedish ring forts?

The geometric plan of the ring fortresses must have been drawn up by a specialist. Construction was probably entrusted to locals, and I would guess that it was servants and peasants whom a local chieftain could order to work for the king.

? Is it likely that archaeologists will find more ring fortresses in Sweden in the future? If so, where might they be?

Whatever the explanation for the ring fortresses, almost all theories presuppose that more were built. So yes, in all probability. Personally, I would look

where important river crossings met roads, so people would have had access.

? What new knowledge have researchers gained by studying the Swedish ring fortresses?

Both Borgeby and Trelleborg were built in two phases, and when studying the fortresses in Denmark, archaeologists did not look for phases. Trelleborg near Slagelse, however, also seems to have been built in at least two stages. Also, Trelleborg in Skåne is interesting because it may be proof of a local chieftain's ambition to demonstrate power to locals and outsiders. At the same time, the origin of the fort possibly dates back to the ninth century, which requires an explanation. Until Bluetooth's

ring fortresses were built, the Viking Age must be considered lacking in castles in both Denmark and Sweden, so Trelleborg stands out if it is as old as assumed. It is therefore paradoxical that the castle was built in a circular manner with four gates dividing the rampart into quadrants, copying the geometric ring fortresses, when the construction

is supposedly 100 years older. The final word has certainly not been said on this matter.

The fortresses were built in two stages, which makes them difficult to date precisely and distinguishes them from the Danish forts.

? Some scholars believe the ring fortresses should be seen in the light of the recapture of Hedeby in 983. Do the Swedish forts give rise to new theories about their function?

In a word? No.

aesthetic reasons and that the three castles should be counted as Viking ring forts. Whether the two Swedish ones were built by Harald Bluetooth is more doubtful, however, because studies suggest that the strongholds are much older than 980.

It was not only the gates that were placed with precision. Inside, the streets intersected exactly at the centre of the circle – corresponding to the rivers on the Christian wheel map. The solidly built streets had to withstand sustained traffic from the 500 to 800 people who manned the castles. Historians don't know who the inhabitants were but one guess is that they were Harald Bluetooth's loyal personal guard and their families.

Young, beautiful and rich

Life in the forts can't just have been about war and defence, as the communities had workshops that made more than military equipment. At Fyrkat, for example, archaeologists have found evidence of blacksmiths who worked gold and silver. At other fortresses, too, they have unearthed jewellery and more traces of a prosperous population.

In particular, two graves uncovered by researchers at Trelleborg confirm the wealth of its inhabitants. In one grave, the remains of a man lay buried with a silver-inlaid timber axe by his side, while in the other, a woman had precious **glass beads** and gold. The couple probably played a prominent role in the daily life of the stronghold – perhaps as overseers of one of the farms.

Archaeologists who have examined bones from the fortress burial sites conclude that many of the buried were young men who were clearly healthy and strong. Their teeth were almost free of cavities and thus in much better condition than those of

Viking people in general. The latest studies of the skeletons show that the warriors grew up outside Denmark, and researchers now believe that they were Slavic mercenaries from the regions south of the Baltic Sea. This is supported by the ring fortresses' many similarities with several of the forts along the southern coast of the Baltic. According to historians, these findings confirm the assumption that the men in the castles were elite troops who were stationed to protect Harald, and therefore kept in peak physical condition.

Forts were meant to intimidate

The presence of the large ring fortresses must have been both awe-inspiring and intimidating to the locals. From the forts, Harald's men could keep order and monitor any incitement to rebel, while also collecting taxes. Silver, meat and grain made up the levies and went to feed Harald's favourites.

When the king and his retinue, who lived in Jelling in southern Jutland, visited the region, the strongholds probably provided accommodation for Harald. Historians also believe that the castles served as trade centres. Craftsmen and traders came there to sell goods to the king's merchants, and the many workshops within the strongholds show that Harald's men produced so much that they attracted trade from the surrounding area.

As the fortresses became known as centres of power and trade, more people began to settle around them. In this way, more communities developed into small towns. For example, the town of Hobro probably grew out of a settlement near Fyrkat. While Harald was building his strongholds, discontent was still bubbling under the surface around Denmark – possibly exacerbated by the

GLASS BEADS

were rare and sought-after jewellery. Other highly prized jewellery was made of amber, bronze or gold.

Viking tools



HAMMER

Archaeologists have discovered hammer heads made of iron. Hammers were used in construction work, together with iron nails up to nine centimetres long, and also in the forge to help make other tools needed for Viking society.



SAW

Saws were essential in the work of obtaining and shaping wood for Viking fortresses, longhouses and ships. The saws were coarse-toothed and required both effort and expertise to pull through the wood.



SPOON AUGER

The spoon auger was used to make holes in wood and was the Vikings' answer to the drill. The metal at the end was shaped like a spoon with sharp edges that – when the drill was turned – cut through wood. At the other end was a handle for turning the drill.



AXES

The Vikings had specialised axes for different kinds of work. The most common was the ordinary felling axe, which is almost identical to today's axes. The Vikings also used an adze, which could be used to carve and smooth out wood.



Ring fortresses were religious temples

Historians have no written sources that reveal the ring fortresses' purpose. There have therefore been many theories about what they were used for. One hypothesis is that they were temples to the gods.

In 1966, the American historian Sidney L. Cohen published his book on Viking ring fortresses, *Viking Fortresses of the Trelleborg Type*. In it, he presented archaeological evidence showing that the fortresses are architecturally extremely similar to thousand-year-old religious gathering places in Germany and Kiev. According to Cohen, **the ring fortresses served as temples to the Norse god of thunder, Thor**, who was worshipped in special ceremonies.

Although the theory has survived to the present day, most academics disagree with it. There is too much evidence against it. For one thing, it would be strange if the king who Christianised the Danes had at the same time invested massive resources in building temples to the old gods. Also, archaeologists see clear Christian inspiration in the fortresses' layout. They resemble the **wheel maps, originally a Christian symbol**, and the forts should instead be seen as Bluetooth's tribute to the Christian world view. Other theories suggest that the strongholds were built to protect Denmark from the German Emperor Otto II, but their location inland weakens this theory. If Harald had wanted to stop a German invasion, the castles would have been more useful closer to the border.

Danish archaeologist Poul Nørlund believed the castles were used to train Vikings ahead of Sweyn Forkbeard's conquest of England in 1013. But the fortifications date back some 30 years before the raids began and may have burned down before

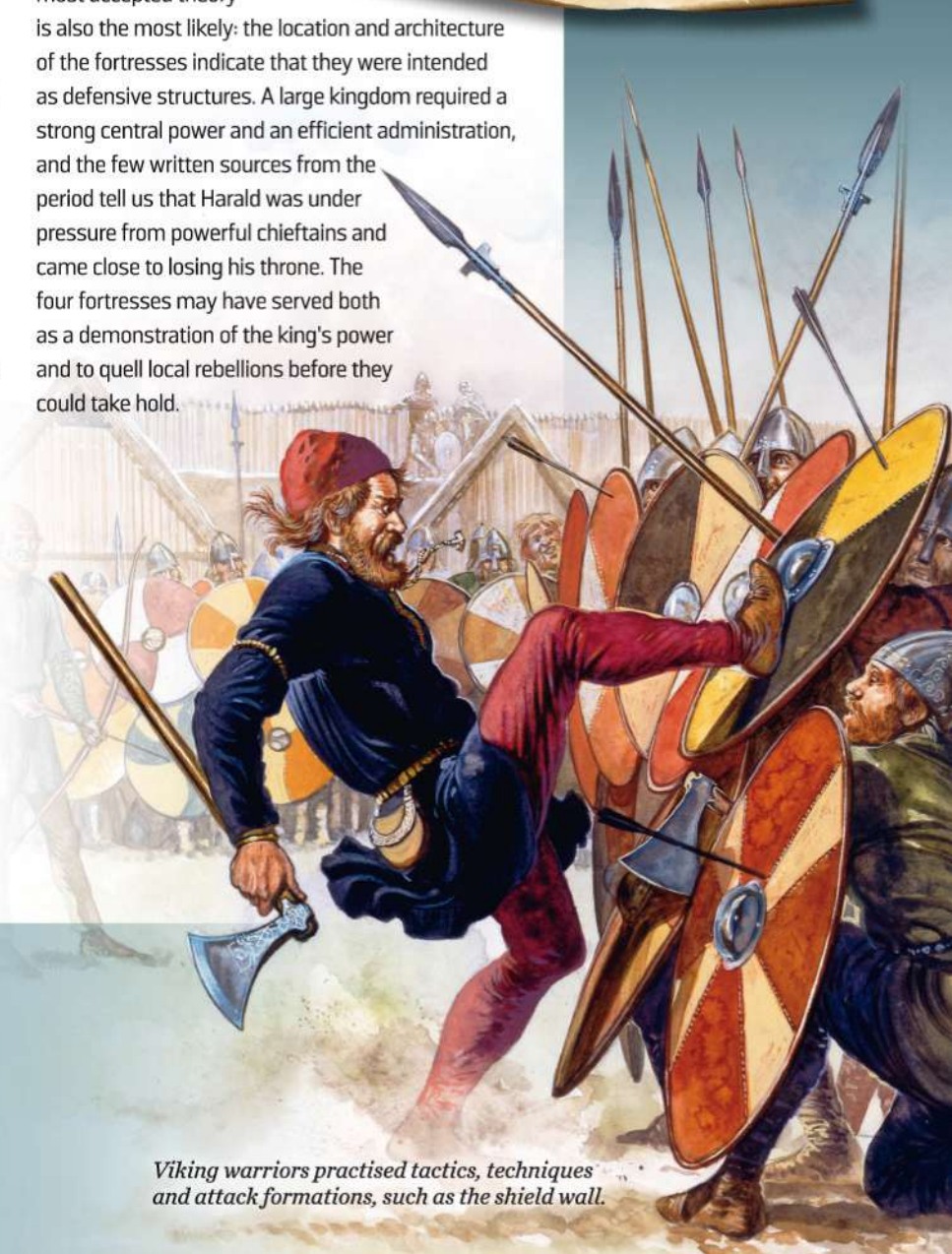
Sweyn began planning his campaign against England. Therefore, the most accepted theory is also the most likely: the location and architecture of the fortresses indicate that they were intended as defensive structures. A large kingdom required a strong central power and an efficient administration, and the few written sources from the period tell us that Harald was under pressure from powerful chieftains and came close to losing his throne. The four fortresses may have served both as a demonstration of the king's power and to quell local rebellions before they could take hold.

THE MYTH IN BRIEF

In the 1960s, American historians came up with the theory that the ring fortresses were sacred places where the Danes worshipped their gods, in the same way as the Celts used the circular Stonehenge for rituals.



The ring fortresses were a kind of Stonehenge for the Vikings, where they worshipped gods.



Viking warriors practised tactics, techniques and attack formations, such as the shield wall.

“The castles were used to train Vikings ahead of Sweyn Forkbeard's conquest of England in 1013.”

construction, which led to enormous costs and, in all likelihood, higher taxes.

Harald's son rebelled

With his focus on securing power from within, Harald could hardly have foreseen that the greatest threat would come from those closest to him. Sweyn, Bluetooth's son, had been apprenticed to his father. In 983, Harald sent the young Sweyn – who was later given the nickname Forkbeard – to Hedeby to capture the border fortress that Emperor Otto II had built after the Danevirke battle. The king's son succeeded in his task and returned home a hero.

The kingdom's chieftains saw Sweyn as a young, intelligent and extremely capable warrior and therefore decided to put him on the throne instead of Harald. Historians do not know why Sweyn consented – perhaps he agreed with the criticism of his father, perhaps it was a personal quarrel between father and son. The *Gesta Cnutonis Regis* chronicle, written some 60 years later, recounts: "When [Sweyn] grew to be a young man, he increased in the love of his people, and, accordingly, his father's envy increased more

and more." The source material is generally too scant and uncertain to draw a definite conclusion about Sweyn's motives. What is clear, however, is that an army under Sweyn's leadership turned against Harald, who immediately fled to Zealand.

There the king met the rebels in battle. Harald lost and fled. In exile, the king assembled a fleet, which in 986 was ready to pursue Sweyn's armada. Bluetooth went to **Jomsborg** where he persuaded the Jomsvikings, an order of mercenaries, to join him. They then went into battle against Sweyn Forkbeard.

The fighting took place at Helgenæs on the Mols Peninsula, and Bluetooth lost. During the battle, the king was badly wounded.

The Jomsvikings took him to Jomsborg, at the mouth of the Oder. Harald died there in about 986 and was buried in Roskilde's Trinity Church, which he had founded.

"Harald ... who first declared Christianity to the Danish people, who filled the whole north with preachers and churches, he, I say, wounded and driven out, though innocent, for the sake of Christ, will not fail I hope, to gain a martyr's palm," the German chronicler Adam of Bremen later wrote of the Danish king's death.

After Harald's death, the popular Sweyn took over the kingship, and both religious and political conflicts quickly faded. Sweyn's method of uniting the Danes was as simple as it was proven: a war against an external enemy. In 990 he stepped up his interest in England, and four years later, Sweyn led a large-scale naval invasion of London.

The foreign adventure ensured that rebellious chieftains and others who might criticise his rule had other things to think about. Success in England sealed the young king's popularity. The ring fortresses soon lost their importance. Immediately after the invasion of London, the strongholds fell out of use and were abandoned. With the kingdom once again at peace, it was simply too expensive to keep a force at the castles and maintain the buildings themselves.

Finds at the fortresses suggest the evacuations were planned. For example, the Vikings made sure to take their weapons with them. At Fyrkat, historians found as many as 150 whetstones, but not a single sword. After that, the forts gently faded into the landscape – until they reappeared about 1,000 years later, when archaeologists removed the turf and exposed the structures. ■

“Sweyn's method of uniting the Danes was as simple as it was proven: a war against an external enemy.”

JOMSBORG

According to the sagas, Jomsborg was a large fortress with a gigantic harbour at the mouth of the Oder in the Baltic Sea. All archaeological attempts to find remains of the fabled Viking fortress in Poland have so far been unsuccessful.

Craftsmen | Carpenter



TOOLS The carpenter used chisels, drills and axes – depending on the task.

CENTRAL ROLE The carpenter built ships, houses and weapon shafts. He was therefore one of the Vikings' most important craftsmen.

The fortresses were built by Harald Bluetooth

- Dating the wood reveals that it **was felled around 980** and thus used for construction during King Harald's reign from 958 to 986.
- The men in the fortresses came from overseas, according to research, which also **confirms that they were healthy, young men.**
- The castles were built with **extreme precision**, requiring specific measurements and knowledge of advanced maths and compass bearings.

7

ring fortresses definitely exist in Scandinavia. Five were built in Harald Bluetooth's time, while the two Swedish ones are older. Researchers are still in doubt as to whether there were any ring fortresses in Norway.

? WE NEED ANSWERS

Who was hired to build the fortresses?

1 No one knows if Bluetooth hired Danish peasants for the construction or whether the castles were built by forced labourers. Some historians speculate that the **fortresses were built by warriors,**

perhaps as punishment – a decision that may have made Bluetooth so unpopular among his men that rebellion began to fester. The theory is supported by the fact that a revolt broke out immediately after the fortresses were completed.

Why were they abandoned?

2 Historians still lack a precise answer as to why the large castles were abandoned so suddenly – in the case of Trelleborg and Fyrkat, the forts were burnt to the ground. The most likely theory is that shortly after the fortresses were built, Denmark was thrown into a state of civil war between Harald Bluetooth and his son Sweyn Forkbeard. **It is possible that the castles were burnt down** during the conflict and never rebuilt.

Why are the castles not mentioned in written sources?

3 Objectively speaking, the Viking fortresses were gigantic edifices in the Viking Age. Yet these conspicuous structures have not left a single trace in written sources or contemporary lore. Neither Adam of Bremen, who wrote his description of Denmark around 1070, nor Saxo's great Danish Chronicle mention the existence of the castles. When excavations began in the twentieth century, **archaeologists only knew of their existence because the ramparts were visible in the landscape.**



Whether soldiers, slaves or labourers built the fortresses remains a mystery.



From the south, the beliefs of Christianity slowly conquered Scandinavia, and the Viking Age faded into history.

WHO WAS THE LAST VIKING?

With trade, raids and conquests came new ideas and a new faith – Christianity. The belief in one god resonated with kings and chieftains, and slowly the Viking era drew to a close. Exactly how and when no one knows, but by the twelfth century, Scandinavia had become a Christian region.

On 29th July 1030, two armies faced each other at Stiklestad, a village in central Norway. On one side, rows of tall, weather-beaten peasants prepared for battle. On the other, **King Olaf** Haraldsson and his faithful well-armoured royal guard waited behind a wall of shields. Swords and helmets shone in the dawn light. Everyone knew that they were about to fight a battle of destiny. A battle between gods.

King Olaf was a committed Christian and wanted the whole of Norway to share his faith. As determined as Olaf was to convert his countrymen to his beliefs, the men of the peasant army were equally resolved to defend theirs. They fought for – and with – Odin and Thor.

As the morning sun glinted off the gold cross on Olaf's shield, the peasant army set off. "Forward, forward, peasants!" the peasants' war cry rang out.

"Forward, forward, Christ's men, cross men, king's men!" resounded the cries of Olaf's soldiers. The Viking era was coming to an end.

The account of the Battle of Stiklestad comes from the Icelandic chronicler Snorri Sturluson, who lived in the thirteenth century. Sturluson

described in detail the Christian Olaf Haraldsson – later known as Olaf the Holy – and his clashes with his pagan countrymen. The account is one of many in the colourful tale of Christianity's arrival in the Nordic countries. Together with finds such as rune stones, jewellery and burial sites, the stories describe the tumultuous time when the Vikings became Christian – and disappeared from history.

Baptism in a barrel

Scandinavia was different from the rest of Europe in terms of religion at the start of the Viking Age. Most of the continent had long since converted to Christianity. Only the Nordic countries stubbornly clung on to paganism.

Missionaries, mainly monks from Germany and England, spread the word of God in Scandinavia as early as the eighth century, but none of them had much impact. It was not until the 960s that Christianity had a breakthrough, when the Danish King Harald Bluetooth became the

first of the Nordic rulers to be baptised.

The German monk and historian Widukind of Corvey, who lived in the tenth century, reported that the king was converted after the German missionary Poppo visited his court. According to Widukind's account, Harald's conversion was due to a miracle. The chronicler wrote that Poppo showed that his faith enabled him to

“Everyone knew that they were about to fight a battle of destiny. A battle between gods.”

OLAF THE HOLY was king of Norway from 1015 to 1028. He was a devout Christian and tried to drive out paganism by force.

carry a hot piece iron in his hands without being harmed. Harald was reportedly so impressed by the Christian God's ability that he allowed himself to be baptised in a barrel filled with holy water.

Historians are sceptical about this explanation, and there is much to suggest that Harald's conversion was more considered than that. In any case, the king was keen for everyone to know about his new religious affiliation. At his mighty manor house at Jelling in southern Jutland, Harald Bluetooth erected a large rune stone as a visible testament to his new faith.

"King Harald ordered this monument made in memory of Gorm, his father, and in memory of Thyra, his mother; that Harald who won for himself all of Denmark and Norway and made the Danes Christian," the king proudly proclaimed on the richly decorated Jelling stone.

Archaeologists were first alerted to the fact that Harald was determined to Christianise the Danes when, in 1820, some locals, trying to find spring water, dug into a burial chamber in the Nordhøjen (North Mound), an eight-metre-high mound near the Jelling stone.

The burial chamber was made of heavy oak planks, the archaeologists discovered. Examining the tree rings in the wood, the researchers quickly determined that the chamber was built from

timber felled in the winter of 958–959. In the room, which was well protected under a layer of rocks and 1.5 million pieces of turf, archaeologists found only a few, albeit prestigious, grave goods, including an exquisite silver cup with a gilded interior that was decorated with animal figures.

The Danish medieval historians Sven Aggesen and Saxo Grammaticus had described in the twelfth century how when Gorm the Old died in 958, he was buried in a mound near Jelling. Everything suggested that the archaeologists had found the king's tomb – but there were no bones.

Skeletal remains were found, however, when, more than a century and a half later – in 1978–79 – researchers excavated beneath the floor of Jelling Church. There lay the remains of a man about 173 centimetres tall. Hundreds of fine gold threads, which researchers believe were woven into the deceased's clothes, and two silver fittings from a belt indicated to the archaeologists that the deceased had been a distinguished man.

The skeleton was too damaged for researchers to extract DNA but, based on the clothing and decoration on the fittings, which resembled that found on the chalice from the emptied grave in the North Mound, researchers believe the dead man was Gorm the Old, and Harald had moved his father from a pagan burial site to his royal estate.

The discovery of a piece of wood that had been split so that it could be used to move the stones above the burial chamber supports the theory. The timber's growth rings show that it came from a tree felled in 965 – the same year that Harald wrote his declaration on the Jelling stone.

It is therefore certain – assuming that the dead man really was Gorm the Old – that Harald moved his father out of a pagan grave and into a Christian church. The move was a demonstration of power, intended to emphasise to everyone that the kingdom was now Christian.

Politics ruled faith

Why was Harald so keen to make his father part of his new Christian dynasty? It wasn't Gorm's wish. He hadn't embraced the Christian faith:

"A savage worm, I say, and not moderately hostile to the Christian people. He set about completely to destroy Christianity in Denmark, driving the priests of God from its bounds," wrote the German Christian historian Adam of Bremen about Gorm the Old.

Historians believe that both the baptism and the relocation of Gorm were about politics. Since the eighth century, Denmark had had a powerful enemy in the south – the Frankish Empire. ➤

Christianity | The Bible



LATIN Around the year 1000, the Bible used in the Nordic countries was written in Latin.

VULGATA The Latin Bible – *Biblia Vulgata* – was translated from Hebrew and Greek between 382 and 405.

The image is a historical illustration, likely a woodcut, depicting a baptism ceremony. In the center, a man is being baptized in a pool of water. He is holding a cross-shaped staff. To his left, a priest in a long, patterned robe is performing the baptism. Several other men in similar robes stand around the pool, some holding books. The background shows a large, arched structure, possibly a church or a palace. A red map of the Frankish Kingdom is overlaid on the top right of the image, with the text "FRANKISH KINGDOM around the year 800" written on it. A white box with text is on the left side, with an arrow pointing to the baptism scene.

FRANKISH KINGDOM
around the year 800

The Viking Rollo was baptised into the Christian faith and in return received the title of Duke of Normandy from the king of the Frankish Empire. This event illustrates how the conversion of Vikings to Christianity sometimes served important political ends.

Under the pretext of bringing its neighbours into the pious fold of Christianity, the empire had pursued an aggressive policy of conquests. For instance, King Charlemagne had fought a brutal war against the Saxons, which ended with their defeat and forced conversion to Christianity in the early ninth century.

After Charlemagne's death, the Frankish Empire was divided and the threat from the south diminished. But in the mid-ninth century, a powerful empire arose again under the German King Otto I. Harald knew that it was now the Danes' turn to be forcibly crushed under Otto's rule. Only by converting could Harald forestall Otto. But Harald gained several advantages from his conversion to the new faith.

In Harald's time, a king's throne was not very secure. Rather than an all-powerful ruler, a king was merely the first among equals, and Harald needed help to stay in power in a world of constant competition from other ambitious chieftains. That was where the Church came in. It had an effective network in the form of priests and administrators – everything Harald needed to fulfil his ambition to be king of all the Danes.

Trade was easier with the cross

In the countries to the south, the rulers had long since consolidated power, but in Denmark, paganism stood in the way. The local chieftains and noblemen took the lead when it came to holding feasts, making sacrifices and worshipping the gods.

For them, worship was a way of maintaining links with and loyalty from the people. With Christianity, power would be centralised and the chieftains would lose much of their influence.

Making his father part of the Christian dynasty strengthened Harald's position as a Christian king and his claim to the throne. But the king was not the only one who gained by converting to

the new faith. Many Christian merchants from abroad called at trading centres such as Hedeby and Birka to exchange goods, and the Norse merchants soon figured out that trade was easier if they worshipped the Christian God. Abroad, baptism, or at least the blessing of the church, was often a requirement for trading privileges in Christian towns. Wealthy Christians could even tempt a Viking with a new set of clothes for the occasion. The garments might have been the deciding factor for some. The monk Notker, who attended a baptism at the Frankish court in the ninth century, wrote of the disappointment of a Viking who – in the absence of more expensive clothes – had to make do with less distinguished garments.

"I've gone through this ablutions business about 20 times already, and I've always been rigged out before with a splendid white suit; but this old sack makes me feel more like a pig farmer than a soldier! If it weren't for the fact that you've pinched my own clothes and not given me any new ones, with the result that I should feel a fool if I walked out of here naked, you could keep your Christ and your suit of hand-me-downs, too!" the Viking moaned.

Because Christianity, unlike paganism, forbade multiple gods, baptism was a big step for many Vikings. Those who were not ready to give up the Norse gods altogether could undergo *prima signatio* (first signing) in preparation for baptism.

At the *prima signatio*, the priest simply made the sign of the cross over the Viking, who could then keep his familiar gods while receiving the same privileges as a Christian.



Christianity in Scandinavia

8TH CENTURY

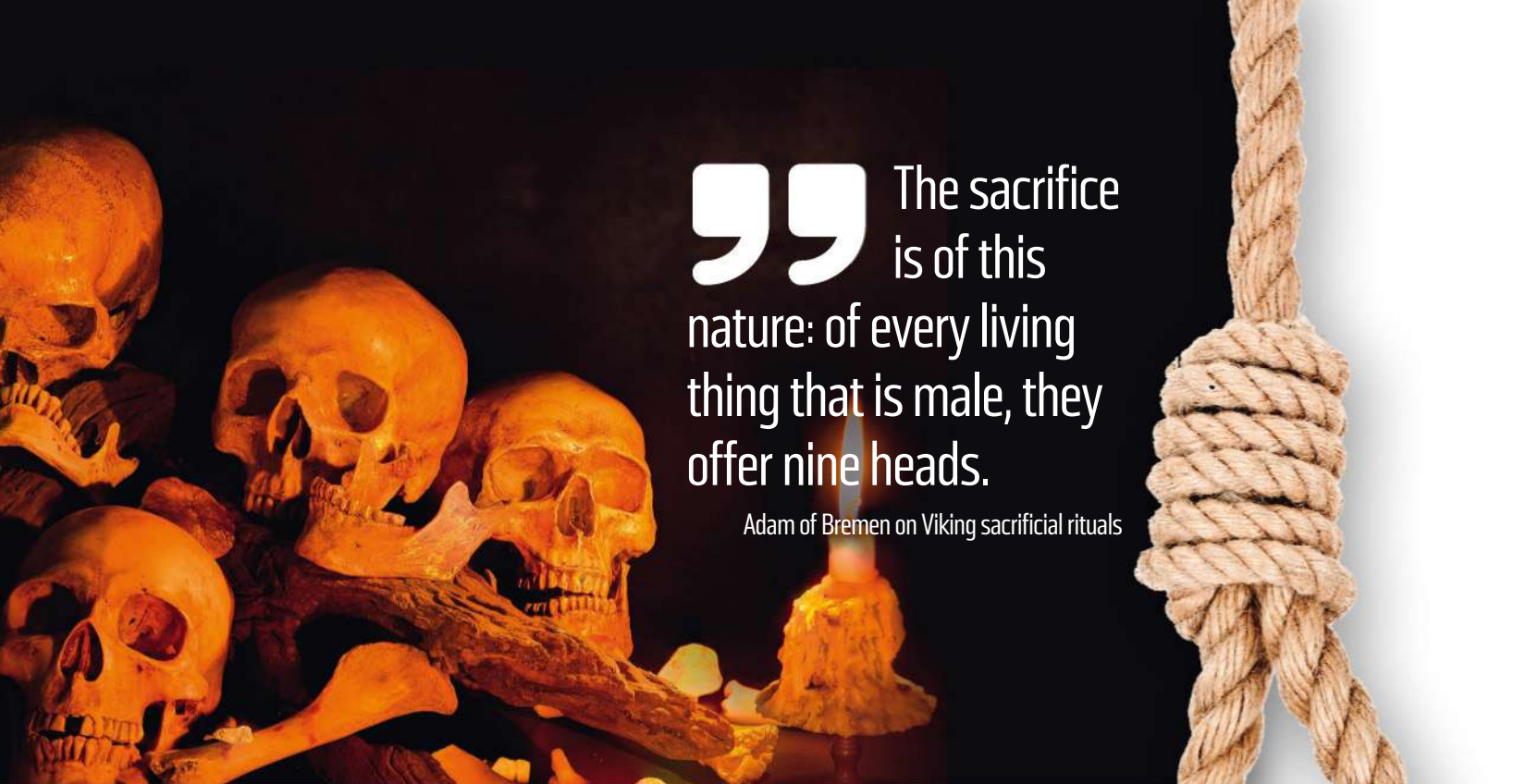
The first missionaries arrive in the Nordic countries. German missionaries such as Ansgar, the Frankish bishop of Hamburg-Bremen, are the best known, but historians believe English missionaries played just as important a role.

c. 850

The first churches are built in the Vikings' most important trading towns, such as Hedeby, Ribe and Birka. The churches are small and built of wood.

c. 960

King Harald erects the great rune stone in Jelling. The inscription proclaims that the king made the Danes Christians. The stone is considered Denmark's official baptismal certificate. Its image of Christ is the oldest in Scandinavia.



“ The sacrifice is of this nature: of every living thing that is male, they offer nine heads.

Adam of Bremen on Viking sacrificial rituals

But was the conversion of the Norse merely superficial, or did the Christian stories about God and Jesus make a deeper impression on the Vikings? When abroad, the Norse saw magnificent buildings, vast riches and powerful men kneeling in the dust to the god whom the locals called Christ. Viking warrior culture admired strength, courage and victory, and they found exactly that in the new religion. For the Vikings, “White Christ” – as the Norse called Jesus – was not a suffering sacrificial lamb. He was a triumphant commander who surrounded himself with a host of angels who victoriously trampled his enemies underfoot.

Christians also had the prospect of a far better afterlife than the pagans. Only a warrior who had died in battle could go to Valhalla, while all Christians went to heaven, the Vikings now understood.

Although there is much evidence to suggest the Vikings sacrificed humans to the gods, it is still not conclusively proven.

“I have been told also that the White Christ is merciful, and refuses forgiveness to no man, whatever evil deeds he may have done, if he will become a Christian and hold the faith in Christ,” the *Saga of King Olaf Tryggvason* recounts. Perhaps the promise of salvation was an important factor. Certainly, many chose to be baptised at the end of their lives, as historians know from a number of runic inscriptions.

“He died in christening robes in Denmark,” for example, is written on a stone in Amnö near Uppsala in Sweden. Other stones, including several in Uppland in central Sweden, refer to ➤

➤ **c. 1000**

Large parts of Norway have embraced Christianity.

The south-western part of the country, in particular, is influenced by English monks. Kings Olaf Tryggvason and Olaf the Holy enforce the new religion.

➤ **1060**

Christianity has gained a foothold in Sweden, but it is not until King Stenkil that Sweden becomes a Christian kingdom. Some regions, including Uppland, still resist the Catholic faith.

➤ **1100**

Most Norse are now Christians. Scandinavians go to church, are baptised and buried as Christians. But several pagan traditions continue to live on.

“white clothes” – the garments worn by the newly converted during baptism and for a week after.

Paganism stuck

Not all Vikings readily embraced the new faith. In Sweden, paganism was stronger than in other Scandinavian countries. In 829–831, the French-born monk Ansgar evangelised in the trading town of Birka, where he was allowed to build a church. When the missionary returned 19 years later, the congregation had disappeared.

However, the discovery of a Christian cemetery – recognisable by the fact that the dead are buried facing east – from the late ninth century in Västergötland shows the new faith had taken hold to some extent.

Around Uppsala, missionaries met particularly strong resistance. According to both Snorri Sturluson and Adam of Bremen, a huge temple stood there in Viking times, where northerners from near and far gathered to worship Odin, Thor and the fertility god Freya. The temple filled Adam of Bremen with disgust, and the Christian chronicler did not mince his words when he described the human sacrifices he believed took place in the temple in his chronicle from 1075–80.

“The sacrifice is of this nature: of every living thing that is male, they offer nine heads, with the blood of which it is customary to placate gods of this sort. The bodies they hang in the sacred grove that adjoins the temple. ... Even dogs and horses hang there with men, and a Christian told me that he had seen 72 bodies suspended promiscuously. Furthermore the incantations customarily

chanted in the ritual of a sacrifice of this kind are manifold and unseemly; therefore, it is better to keep silence about them,” Adam of Bremen wrote.

Historians have found no trace of human sacrifices in Uppsala, so assume the accounts are pure fabrication. On the other hand, scholars believe Adam of Bremen’s claim that Christians had to participate in ceremonies or buy immunity from them, which seems to prove paganism was still strong in the area in late Viking times.

The missionaries did what they could to break the pagans. According to Adam of Bremen, a bishop named Adalward, who preached in Sweden

around 1060, agreed with the Scanian bishop Egino that they should destroy a pagan shrine, for “if it was torn down, or preferably burned, the conversion of the whole nation might follow”.

However, the Swedish King Stenkil (c. 1028–66) talked the bishops out of the plan. He convinced the holy men that they would be killed by angry Swedes, and the newly converted would simply revert to paganism. Instead, the two bishops went around southern Sweden and “broke up idols and thereafter won many thousands of pagans to Christianity”.

Norway was to be forcibly crushed

By the 1060s, Sweden was largely Christianised, with Västergötland the stronghold of the new faith. But as late as 1080, a Swedish king warned two bishops against interfering with the temple in Uppsala. If they did, he implied, it would mean the end of both the bishops and the king.

It would not be until 1164 that the last bastion fell – Uppsala, the centre of paganism, ►

“The discovery of a Christian cemetery from the late ninth century shows the new faith had taken hold to some extent.”

Traces of the Viking Age



CHRISTMAS DINNER

Winter was long for the Vikings.

So, every January, they held a celebration where they feasted on meat, beer and mead for three nights. When Christianity arrived, they moved the feast to the day Christians established as the Saviour’s birthday.



NAMES OF DAYS OF THE WEEK

The Norse gods live on in the days of

the week. Tuesday is the day of Týr, Wednesday is Odin’s day, Thursday is the day of Thor, while Friday is named after Frigg, Odin’s wife. The Danish *Lørdag* (Saturday) comes from the Vikings’ *løverdag* (washing day).



ELVES

The Vikings believed in many creatures,

including gnomes, goblin-like guardians who looked after homes and farms. To secure their help, the Norse brought them bread, porridge or beer. After the introduction of Christianity, the sprites lived on as garden gnomes.



THING

The great men of the Viking Age met to

make important decisions, and the *thing* lives on as a legislative institution and linguistically in the parliaments of Folketing in Denmark, Storting in Norway and Løgting in the Faroe Islands.

**MYTH-BUSTER****Poppo's ordeal**

Red-hot iron proved existence of God

Christianity came to Scandinavia because of a miracle, when the priest Poppo proved God's existence by putting on a glowing iron glove. The myth may hold a grain of truth.

The story of Poppo's ordeal by iron is probably just a legend, but it may contain an element of truth. The story was written down by the German monk Widukind of Corvey in his chronicle of the Saxons' exploits in 968. According to Widukind, the miracle that convinced Harald of the superiority of the Christian God occurred after a discussion at a feast attended by the king and Poppo. Harald and the other Vikings who were present declared that Poppo's Christ was indeed a kind of god, but that **other gods were much greater and far more powerful**. Poppo replied that "there is one true God, the father, along with his only begotten son, Jesus Christ, and the Holy Spirit" while the Vikings' idols were "demons and not gods", the chronicle says.

Harald challenged Poppo to prove his faith. The priest eagerly agreed. The king "ordered that a very heavy piece of iron be heated in the fire. He then ordered the cleric to carry this glowing iron for his Catholic faith," Widukind reported. Poppo succeeded.

"The confessor of Christ seized the iron without any fear at all, and carried it far as the king had ordered. The priest then showed everyone his unharmed hand, and gave proof to everyone there of his Catholic faith. As a result, **the king became a Christian and decreed that God alone was to be worshipped**. He ordered all of

his subjects to reject idols," the chronicle reads. Historians admit that the story may contain some truth because in the early Middle Ages, ordeals by hot iron were frequently used to decide questions of guilt. The suspect held or walked on a heated piece of iron. The hand or foot was bandaged, and a few days later a bishop examined the wound. Inflammation meant the suspect was guilty, while a wound that healed quickly and cleanly indicated innocence. If Poppo did endure ordeal by hot iron, it seems likely he recovered from his injuries quickly.

THE MYTH IN BRIEF

When the German priest Poppo visited Denmark in the 960s, King Harald Bluetooth challenged him to prove that the Christian God was superior to the Norse gods. To convince Harald, Poppo carried a piece of red-hot iron in his bare hands. The scorching metal left Poppo unharmed, so Harald converted and was baptised into Christianity.



Poppo is depicted here with a large glowing iron glove on his right hand.



Harald Bluetooth is baptised into the Christian faith.

” The king "ordered that a very heavy piece of iron be heated in the fire. He then ordered the cleric to carry this glowing iron for his Catholic faith."

where the temple thereafter became the seat of the Swedish bishop.

In Norway, the advent of Christianity was unusually violent. There, the new faith sparked civil war and cost the lives of two kings. The first was Olaf Trygvason, who became king in 995 under the name Olaf I. Olaf was almost fanatically intent on eradicating paganism in Norway.

Shortly after his coronation, Olaf I held a *thing* (meeting) in **Tønsberg**. There he promised to expel all sorcerers. Olaf then invited the sorcerers to a big feast, where everyone was treated to plenty of food and drink. When evening came and everyone was drunk, Olaf ordered all the doors to be barred, then set fire to the hall. Only one sorcerer – Eyvind Kelda – escaped. But Olaf pursued him north with

his ships, and on the eve of Easter Sunday, Eyvind was captured on Karmøy, near Stavanger.

With Eyvind was a small army of sorcerers. Olaf had them all chained to a rock, and when the tide came in, they drowned.

Olaf continued to Mære in Trøndelag, near Trondheim, where a great pagan shrine was located. The king entered and struck the statue of Thor with his axe. He then gave the locals the choice of being converted to Christianity or killed, so that, as Snorri Sturluson bluntly wrote, “all the people in the Trondheim district were baptised”.

Holy king died for Christianity

Why the Norwegian transition to Christianity was so harsh has long been a point of speculation

Olaf the Holy is stabbed to death in the Battle of Stiklestad. Although his army lost the battle, Norway became Christian shortly after his death.

TØNSBERG
is Norway's oldest town and was an important centre in Viking times. It is located about 100 km south-west of Oslo.



for historians. The key to an explanation may lie in Olaf's background. Unlike Harald Bluetooth, who was probably a pragmatist who used religion politically, Olaf was a committed Christian.

Snorri Sturluson reported that in his youth Olaf had sailed as a Viking to the British Isles. In 986, he met a Christian soothsayer on the Scilly Islands.

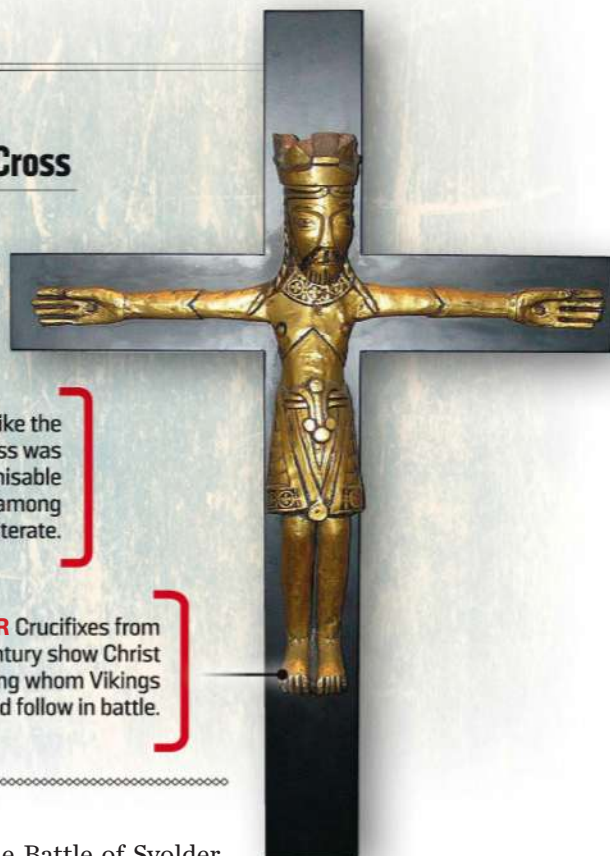
"You will become a famous king and work famous deeds," the seer told him. The soothsayer also told the king that he was going to persuade many people to be baptised. To convince Olaf, the seer said the king would receive a sign in the form of an attack by his own people. As soon as his wounds were healed, he would be baptised. When Olaf returned to his ships, he was attacked and wounded by his men in a mutiny. Impressed, he was baptised as soon as his injuries healed. Eager to fulfil the rest of the prophecy, he sailed to Norway, where he took advantage of a rebellion to become king. He then set out to convert Norway.

Olaf continued to destroy shrines and kill and torture pagans until around 999, when he clashed

Christianity | Cross

SYMBOL Like the hammer, the cross was an easily recognisable symbol – even among the illiterate.

COMMANDER Crucifixes from the twelfth century show Christ as a victorious king whom Vikings could honour and follow in battle.



with a rival at the Battle of Svolder.

The fortunes of war went against the king's forces and, to avoid falling into enemy hands, he threw himself overboard.

The later King Olaf Haraldsson – who was to become known as Olaf the Holy – was equally radical. Like Olaf Tryggvason, Haraldsson was a veteran of Viking raids and a devout Christian. After losing power in Norway in 1028, Haraldsson managed to land in the country again in 1030 in an attempt to regain the throne. The pagans among the Norwegians knew from experience what they had in store, so gathered a huge army to oppose the Christian king.

Most of those present were peasants – and at 14,000 men, the largest army Norway had ever seen. The king, in turn, had only his faithful royal guard and those soldiers he'd managed to recruit along the way. On 29th July 1030, the two armies faced each other at Stiklestad in central Norway.

Solar eclipse fixes time of battle

Battles and events in this period of history are difficult to date. Historians believe they know when the Battle of Stiklestad took place because legend has it that a shadow moved in front of the sun as the two armies approached each other, and an eerie twilight descended just before the battle.

Modern academics have investigated whether there was an eclipse that year and, if so, when. Using astronomical calculations, they have been able to determine that the eclipse – and the battle – actually took place on 31st August. No one on the battlefield knew what an eclipse was, so the warriors were gripped by fear. Many felt that ➤





The baptismal font in Gettrup Church bears witness to the time when Denmark became Christian. The font is decorated with both Thor's hammer and the cross.

this was a sign from heaven and that before the day was out, they would all know who was more powerful: the old gods or Christ.

The outcome of the battle was a foregone conclusion. The peasant army was far larger than Olaf's small assembly, and although the king's men had the upper hand at first, his forces were soon beaten back. The sagas say that Olaf fought bravely, but in the end he fell. First he received an axe blow to the leg, then a spear thrust to the stomach and finally a stab to the throat.

Most of the king's army died on the battlefield with Olaf. The peasant army and the old religion prevailed. But not for long.

In death, Olaf delivered a final triumph. Snorri described how one of the peasant leaders – Thórir the Hound – wanted to move the king's body. When he washed Olaf's face, Thórir got some of the king's blood on his hand. He was about to wipe it off when he discovered that the wound he had received in battle had been healed by the blood.

Pilgrims journeyed to Trondheim

The legend of Olaf the Holy spread throughout Norway and across Europe. It was said that the sick were cured simply by visiting the king's tomb, and the church where Olaf was buried in Nidaros (now called Trondheim) became one of Europe's most popular destinations for Christian pilgrims.

Few now doubted that Olaf had been right and Christianity should be the true religion of

the Vikings. In death, he managed to Christianise Norway. During the twelfth century, the religion almost completely replaced paganism in Scandinavia. At the same time, Norse society changed. Small communities gathered around the chieftain and his family, forming nations with a strong, central royal power.

That this change did not happen overnight is demonstrated by several archaeological finds. Paganism and Christianity existed side by side for a long time. A woman buried in Thumbby-Bienebek, near Hedeby, has a silver cross around her neck and iron Thor's hammers nailed to her coffin.

At Trend in Jutland, archaeologists have found a mould that could be used to make both Thor's hammers and crosses. Many people seem to have felt like the Viking Helgi the Lean, who in the twelfth-century script *Landnámabók* says that, although a

Christian, he prayed to Thor when he was in serious trouble. According to historians, evidence from all over Scandinavia shows that paganism lived on long after the Vikings had officially become Christian. One tangible reminder is a thirteenth-century baptismal font in Gettrup Church in Jutland. Although the font was made some time after the Norse converted to Christianity, it is decorated with both a cross and a hammer.

The names of the old gods are still hidden in our days of the week, such as Odin's Day and Thor's Day (Wednesday and Thursday), and some Scandinavian words are relics of the Norse past.

For example, the Viking *thing* has become the Danish Folketing, Norwegian Storting and Faroese Løgting – various Scandinavian parliaments. The function of the assembly also basically remains the same – the *ting* is still where free people meet to make laws.

At the same time, the traditions of the Vikings moved on and merged with those of the Christians. Christmas is actually an old Viking festival that was linked to the birth of Jesus by the Church. In the north, they continued the drinking and eating that had characterised the pagan celebration of the Yule season – a feast held when the winter darkness and cold hit Scandinavia in earnest.

Although the final Vikings officially disappeared just over 900 years ago, they still live on today, with paganism even experiencing a revival. The last Viking is alive right now. ■

It was a gradual transition to Christianity

- The first missionaries went to Scandinavia in the **eighth century**.
- The Danish king Harald Bluetooth was the **first Nordic monarch to convert to Christianity** in the 960s.
- During the transition period, **Christianity and paganism coexisted** for several centuries.
- Christianity helped the kings of the time to **consolidate their power**.

9TH

century was when the first churches were built in Denmark. The houses of worship were located in Schleswig and Ribe, and built with royal permission by the missionary Ansgar.

? WE NEED ANSWERS

Did people worship the old gods in private?

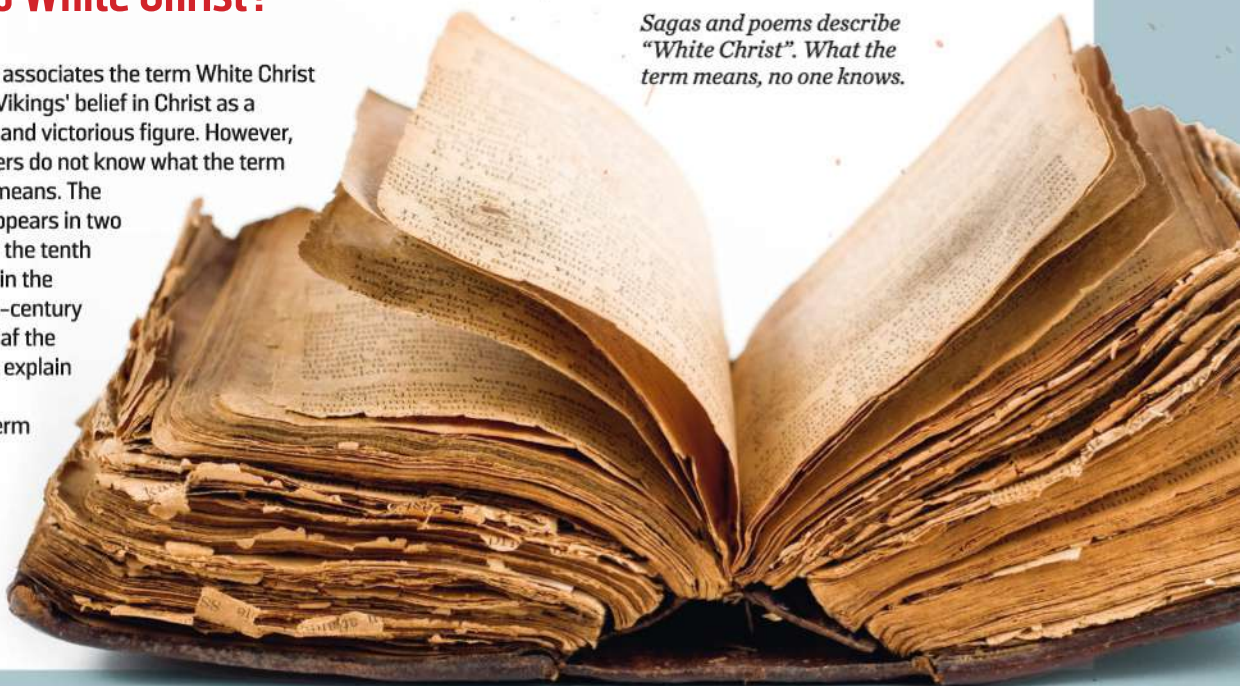
1 In Iceland, the people made a compromise that **allowed them to be baptised and to practise paganism privately**. It's possible that people in other parts of Scandinavia practised something

similar unofficially. During the Viking Age, ordinary folk were unable to write, and private worship would have left little archaeological evidence behind, so historians cannot currently give a definitive answer.

What did the Vikings mean when they referred to White Christ?

2 Posterity associates the term White Christ with the Vikings' belief in Christ as a powerful and victorious figure. However, researchers do not know what the term actually means. The phrase appears in two Icelandic shield poems from the tenth and eleventh centuries, and in the *Flateyjarbók*, the fourteenth-century manuscript of the saga of Olaf the Holy. But the sources do not explain what the term means. Most historians believe that the term **simply refers to the white robe** that the Norse wore when they were baptised.

Sagas and poems describe "White Christ". What the term means, no one knows.



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“Fear not death for the hour of your doom is set and none may escape it.”

That advice comes from the *Volsunga Saga*, one of the few sources we have about the Viking Age that were written by the Norsemen themselves. Like most of their texts, the saga is about heroic warriors who dream of spending their afterlife in Valhalla. As such, it neatly sums up the two aspects of Viking culture that have come to define it for most people today. The Viking world was far more complex, however. The Norse founded trading colonies, revolutionised agriculture and built a world of gods inspired by those from Asia and antiquity. In this sense, the Viking Age probably began much earlier than previously assumed. Based on advanced techniques and exciting new discoveries, researchers are now uncovering the truth about the Vikings and how they shaped our world. Join us as we discover what they've learned...

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